

Construction Methods AND EQUIPMENT

A MCGRAW-HILL PUBLICATION • FIFTY CENTS

OCTOBER, 1956



On Kansas Turnpike, train of paving equipment gangs up to pour 10-in. slab in a hurry . . . p. 2

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**"WE LIKE
Yellow Strand
VERY MUCH.
It outlasts other rope."**



says:

**Edward S. Mando, Contractor,
Erie, Pa.**

Moving the 72", 5-ton section of concrete pipe into ditch with special hook and pin arrangement welded to shovel. Yellow Strand Wire Rope stands up to heavy load, resists kinking, remains flexible.

This storm sewer contract specifies 11,000' of storm sewer, including 3,000' of 72" concrete pipe. Sections of the concrete pipe weighed well over five tons each . . . this is reported to be the heaviest job of its kind ever to be done in Erie area. The pipe was laid by the same backhoe that dug the trench, and to

handle the load, the shovel had to be specially counterweighted.

Edward S. Mando, Erie contractor, knew that he'd need tough, abrasive-resistant and flexible wire rope for the job. He specified Broderick & Bascom Yellow Strand. Speaking from his experience on this contract and many other jobs

over the years, he says, "We like Yellow Strand very much. It outlasts other rope."

On the heaviest jobs . . . on the most rugged and demanding wire rope applications throughout the world, you'll find B & B Yellow Strand working as a vital and productive link between the machine and the material being handled. Make sure this link doesn't become a bottleneck for your production. Specify Yellow Strand next time you order wire rope.

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B.F. Goodrich



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tires with *all-nylon* cord construction.

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Nylon withstands double the im-

pact of ordinary cord materials, resists heat blowouts and flex breaks. That's why B. F. Goodrich builds *all* of its off-the-road tires with an *all-nylon* body, why they can be recapped over and over!

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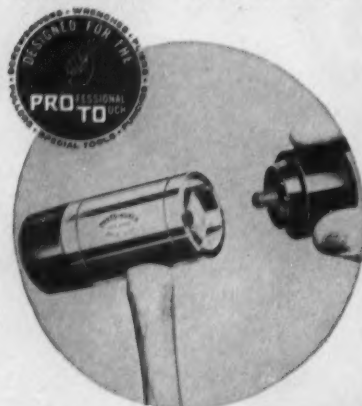
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Construction Methods AND EQUIPMENT

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On the Cover

This team of paving machines does a fast job of laying down a 10-in. slab on a 27-mi section of the Kansas Turnpike. Contractor is J. A. Tobin Construction Co. of Kansas City, Kans. Tobin has two Kochring 34-E Twinbatch pavers and one Blaw-Knox spreader at work on the 7-in. first course. After 6x12-4/4 welded wire fabric is placed, Tobin teams one Kochring 34-E paver, one Jaeger spreader, two Blaw-Knox transverse finishers, one Kochring longitudinal finisher, and one Cleft belt and drag machine to mix, place, strike off, and finish the 3-in. second course.



Member



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October, 1956

Pay Dirt in This Issue

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Fire hoses and pumps team up to remove 30,000 cu yd of silt from the mile-long third tube of the Lincoln Tunnel.

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Mounting drills and compressors on tractors and a drill barge enables contractor to speed waterway widening job.

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Next Month

An ultra-modern construction plant moves concrete placing into high gear at India's colossal Bhakra Dam. Rising 700 ft across a deep gorge in the foothills of the Himalayas, the dam requires 5,400,000 yd of concrete.

IT'S *Whiteman* **ALL THE WAY!**



Highest efficiency, maximum speed and greatest economy in transporting and laying concrete is achieved with complete Whiteman mechanization from batching plant to the finished slab.

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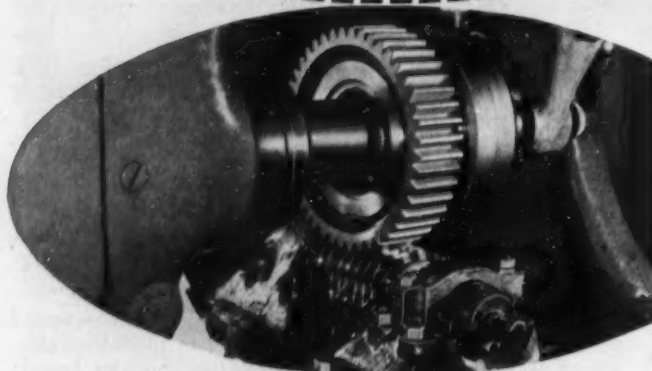
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it pays to use

True Original Parts



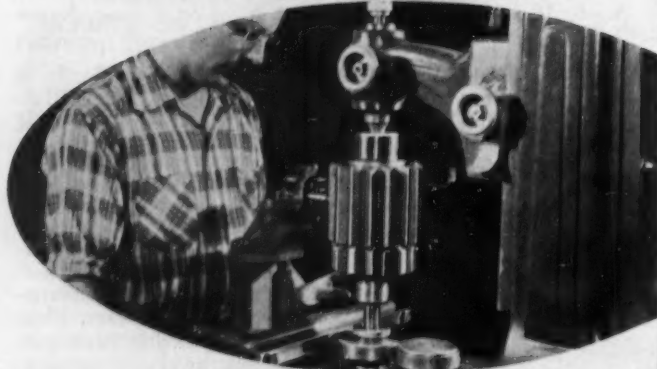
Allis-Chalmers True Original Parts start right. Each benefits from one of industry's most intensive metallurgical research programs. And each is designed by experienced construction machinery engineers to do a specific job . . . with ample capacity to carry a full share of the work load just as the new equipment part did.



1

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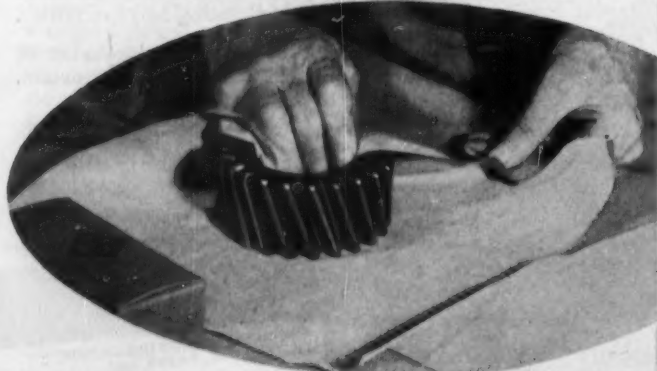
Skilled craftsmen bring True Original Parts to life—working with the most modern manufacturing equipment and meeting the highest industrial standards. The result: precision-made parts get full work power from your Allis-Chalmers machinery.



2

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True Original Parts go through rigid original-equipment inspection and testing processes to assure long-life service. For example, gears are checked again and again for perfect meshing . . . for true balance . . . for full capacity.



3

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You want your parts factory-new . . . and that's how you get True Original Parts. Many are specially treated . . . then sealed and packaged against rust, dust and damage.

A country-wide network of dealers stock ample supplies of True Original Parts. Whether you're working in one area or across the country, you can depend on reliable parts service close to your job from your Allis-Chalmers Construction Machinery dealer.

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**Model
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The Northwest Dual Independent Crowd that utilizes force most independent crowd shovels waste, the "Feather-Touch" Clutch Control, the Cushion Clutch, Northwest design and construction and other Northwest features all combine to give high output in tough digging.—And, if you have a *real* Rock Shovel you never have to worry about output in *any* kind of digging.

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**Model
41**

1 yd. Capacity



**Model
25**

¾ yd. Capacity



OS-4-1CG

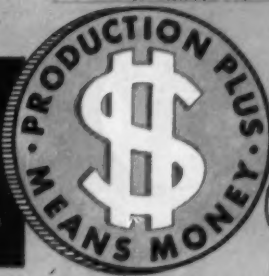


**Model
6**

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Why Marfak gives better, longer-lasting bearing protection

THE REASON lies in *Texaco Marfak's* unique "sealing-in" action. *Marfak stays in* chassis bearings, even under heavy shock loads on rugged terrain—forming an effective seal against dust and dirt, preventing rust. And *Marfak's* tough lubricating film keeps wear at a minimum. Results—longer life for all parts, lower maintenance costs.

Texaco Marfak Heavy Duty does the same outstanding job in wheel bearings. It shuts out dirt and mud, assures safer braking and extra thousands of miles between lube jobs. No seasonal change is needed.

If you prefer a multi-purpose lubricant for chassis, wheel bearing, water pump and other grease lubrication — new, lithium-base *Texaco Marfak*

Heavy Duty Special 2 is your answer.

More than 625 million pounds of Texaco Marfak have been sold.

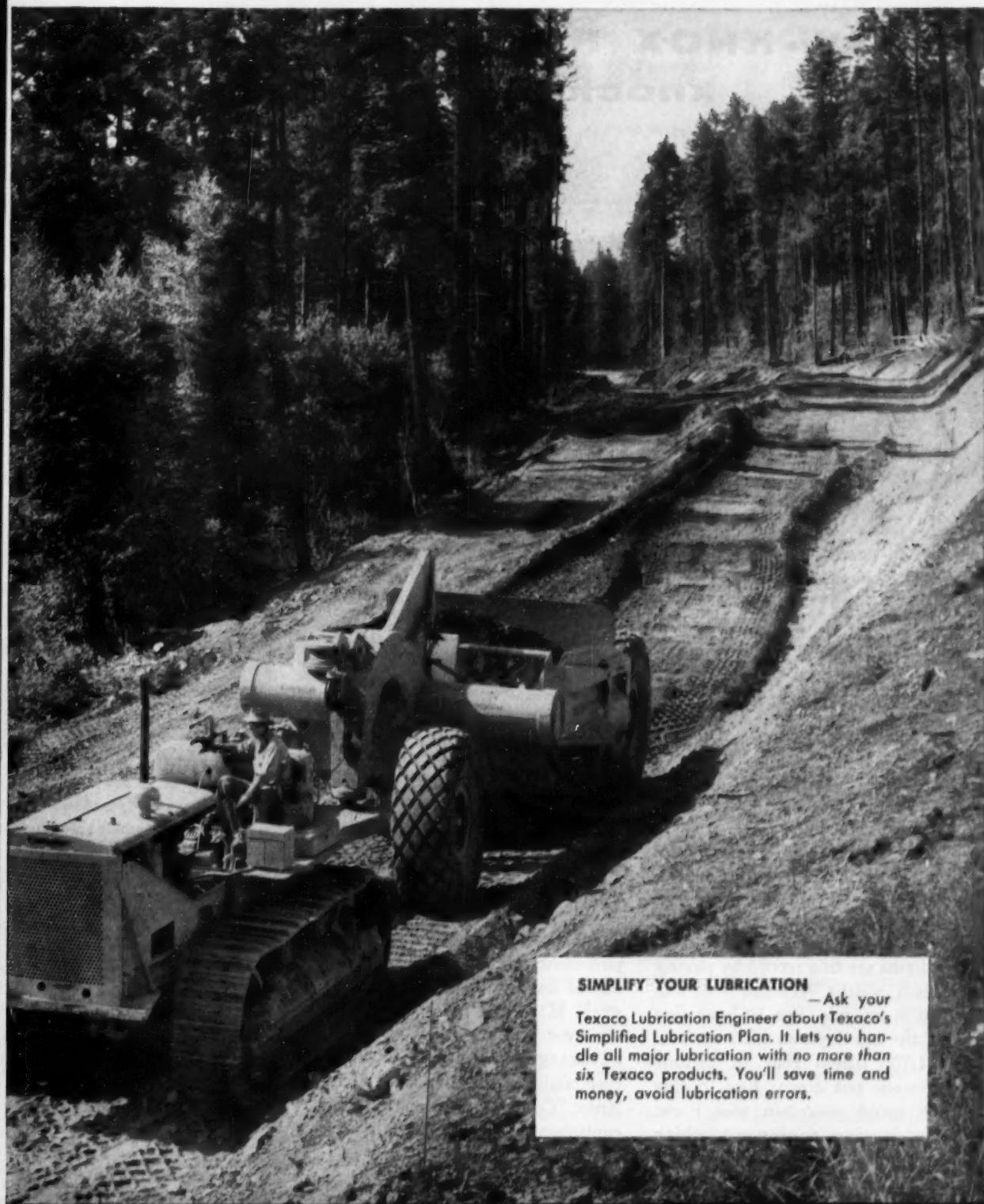
Here are two more Texaco names to remember: *Texaco Track Roll Lubricant* for smoother-working, fully protected crawler mechanisms; *Texaco Universal Gear Lubricant EP* to assure more dependable, lower-cost performance from differentials and transmissions.

Get the full story on cost-cutting Texaco lubricants from a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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**sq. yds. of 10-in.
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poured in 23 ten-hour
working days**

● This is the record Williams Paving Company made on the northeastern extension of the Pennsylvania Turnpike System. Williams set this record by paving in 24-ft. widths. Average pour was 3,606.78 sq. yds. per 10-hour day and the top day was 4,533 sq. yds. or 1,700 lineal feet of 24-foot pavement put down. Key to this high speed operation was Blaw-Knox paving equipment which

included two MultiFoote Pavers, Spreaders and Road Forms.

You will set profitable records on your single- or dual-lane paving jobs, too, when you use Blaw-Knox "Complete Package" paving equipment. From subgrade to finished pavement, this equipment is designed for high speed coordinated work. More and more contractors all over the country are taking advantage of one-source, one-responsibility economies of Blaw-Knox "Complete Package" paving equipment and methods.

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- MultiFoote Paver
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- Concrete Finishing Machine
- Clamshell Buckets
- Concrete Buckets
- Hi-Boy Trukmixers
- Ready Mix Batching Plant



BLAW-KNOX COMPANY, Mattoon, Illinois
Construction Equipment Division

38 CHARLESTON AVENUE

Construction News from Washington

Washington, D.C.
October, 1956

College Housing Booms

A new building boom is taking place on the college campuses of the nation. Enrollments this fall will skyrocket past the 3 million mark and so construction demands are mushrooming.

Housing and Home Finance Agency loan application files reflect this upsurge. Since last summer, HHFA has had requests for loans totaling almost \$500 million. During the previous four years of its college loan program, the total of all requests came to only about \$300 million.

All kinds of facilities are involved—classrooms, dormitories, dining halls, laboratories. As of now, HHFA says, only about \$250 million of its \$750 million college loan fund is uncommitted. Congress probably will replenish the lending authority next session.

Tightness of commercial credit probably has some effect, but the basic factor is the rush to the campuses. Only a year and a half ago, government officials were forecasting that the collegiate population would not top 3 million until 1960. Now, they see 3.5 to 4 million by 1960, and up to 5 million by 1965.

Public Power in the Campaign

Power development has become one of the liveliest domestic issues of the 1956 presidential campaign. Democrats are working it hard.

The debate ranges over a wide field. Democratic strategy is to attack the Administration record on three broad fronts. They charge Republicans with:

- Failure to launch a single new federal power project.
- "Virtual junking" of low-cost power expansion.
- Delay on the peacetime atomic energy development program.

Main arena for the battle on the power question is the Pacific northwest. In the Washington state primary elections, Sen. Warren G. Magnuson (Dem.) ran about 8 to 5 ahead of his Republican rival, Gov. Arthur Langlie, and public power was a leading issue in the contest.

Interior Secretary Fred A. Seaton is the Administration's trouble-shooter in the power field.

He is telling interviewers these days that federal spending for public works is going up in the foreseeable future because the Administration has no intention of letting the nation encounter the stifling power shortage that Democrats have been forecasting for the past three years. This means that the government will develop projects when local interests and private industry cannot.

But he is stressing that it does not mean an abandonment of the partnership principle. In fact, Seaton is hitting hard on Congressional obstruction of the proposed John Day Dam in Oregon, a \$310 million project. Private power interests have offered to

put up \$270 million of the cost in return for a 50-year contract giving them the energy output. This, Seaton is arguing, is the type of partnership that must be adopted.

Tight Money Continues

Construction is in a money squeeze, and there's no relief in sight. The rise in interest rates has been sharp.

One of the country's top-rated utilities—Michigan Consumers Power Co.—recently paid 4% on a 30-year bond issue, highest for such an issue in a quarter of a century. When New York banks raised the rate on loans to the country's best credit risks—from 3¾ to 4%, they established a 23-year high.

Bankers are being flooded with requests from borrowers for loans to meet the seasonal rise in business that traditionally starts in the autumn and runs through Christmas. The general tightness of money is pinching banks, and many of them have begun to ration loans. Banks are telling customers they can have what is needed for normal, day-to-day business but are more and more unfavorable toward loans for expansion and improvement. It's hard to tell yet how extensive this sort of rationing is, but it's bound to be on the rise between now and the first of the year.

The Fed could, of course, ease the situation by making money more readily available to the banks. But it won't. Officials are convinced that inflation is again a lively threat, and that tighter money is the medicine needed.

More Business for Road Builders

Suburban growth to take care of increasing population will require construction of 500 miles per year of new streets and roads during the next 20 years. The yearly requirement breaks down to about 375 miles of local roads and streets plus 125 miles of arterial trafficways to serve the expanding residential areas.

Consulting economist Robinson Newcomb of Washington came up with these estimates in projecting future needs for the annual meeting of the Institute of Traffic Engineers. The Urban Land Institute assisted Newcomb in developing the figures.

Highway Construction Speeds Up

Interstate highway projects are advancing to the contract stage at a constantly increasing pace, according to the Bureau of Public Roads. By mid-September, the agency was able to report this progress in a single week: authorized for bid advertising, 15 projects involving 42 miles of highway worth \$21 million in 10 states, plus four contracts awarded for nine miles costing \$1.2 million.

Contract activity will continue to speed up week by week for the next two years, the Bureau predicts. During the first two months of the big new program, July and August, 90 projects valued at \$85 million were placed under contract.

On the St. Lawrence Seaway...and the World Over Bucyrus-Eries Prove that Good Equipment DOES Make a Difference



One of two Bucyrus-Erie 150-B 6-yd. shovels responsible for much of the 2.7 million cubic yards of excavation for the Iroquois control dam. This \$14-million structure will maintain the levels of Lake Ontario.

On the St. Lawrence Power and Seaway projects some extremely tough digging conditions have been encountered — glacial till with the density of concrete, sticky blue marine clay, and heavy boulders. In the thick of this rough going Bucyrus-Erie Ward Leonard electric shovels are handling big yardages, week after week, month after month — proving that good equipment *does* make a difference.

The extra margin of quality that makes these machines standouts on tough jobs gives you better performance in any digging. Their smooth-acting Ward Leonard electric control provides extra fast acceleration and deceleration to speed work cycles. Superior front-end design furnishes plenty of strength while reducing deadweight. And heavy-duty construction holds down maintenance costs as it lengthens machine life.

Bucyrus-Erie Ward Leonard electric shovels can make a difference on your jobs, too. We will be glad to provide complete information.

75L56C



BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

See You at the ROAD SHOW • CHICAGO • January 28-February 2, 1957



This trailer-mounted Model 250, shown cleaning blacktop dump truck, serves 4 shops.

Malsbary Steam Cleaner Proves "Quick Cure" for Maintenance Headaches, Winter and Summer

When Brown County (Wis.) bought a trailer-mounted Malsbary 250 HPC Cleaner in 1955, Commissioner E. Francis Brunette and Shop Superintendent Stanley Queoff soon found many uses for it other than shop cleaning work.

In winter, it quickly removes snow and ice from snow plows, trucks and traffic patrol squad cars, keeps them ready for quick action. When thaws threaten to flood roads, it is easily rolled out and acts as an extra culvert thawing unit.

During summer, the Malsbary 250 cleaner is kept in the field to clean blacktop mixing plant, and spreading and hauling equipment. Blacktop equipment is cleaned "every chance we get" ... but all county equipment gets a thorough steam cleaning at least twice a year.

"Our cleaner averages 5 to 6 hours daily, 5 days a week. There's no comparison with methods used before. Time saved permits assignment of workers formerly used on cleaning, to other tasks. Even more important, all equipment gets more frequent attention. No trucks or graders need be out of action long, for cleaning.

"The cleaner adds punch to our toughest assignment, keeping highways open and safe during winter storms," reports Queoff and Brunette.



Special orifice in steam gun confines high-pressure stream to small area, speeds cleaning of motor grader and tracks.

Malsbary HPC — Fast and Efficient

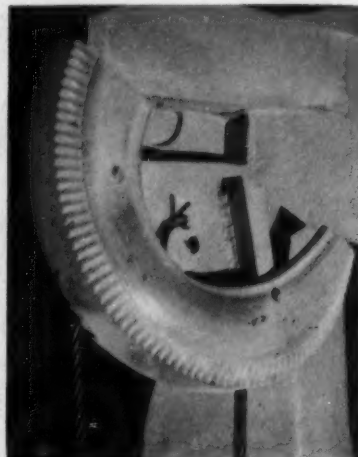
Malsbary HPC (high pressure combination) cleaners combine pumped hydraulic and thermal pressures, give you a 300 to 400-lb. cleaning blast, hot or cold, with or without solution. This HPC blast cleans twice as fast as the largest steam vapor cleaner; 4 to 10 times faster than most, easily handles jobs other cleaners can't touch. HPC cleaners also supply wet steam for degassing and heating; low pressure hot water for rinsing.

See for yourself what HPC cleaning—available only from Malsbary—can do for you. Ask your Malsbary dealer for a demonstration on your job NOW, or write today for free catalog.



Room C10, 845-92nd Ave., Oakland 3, Calif.

Job Talk ...



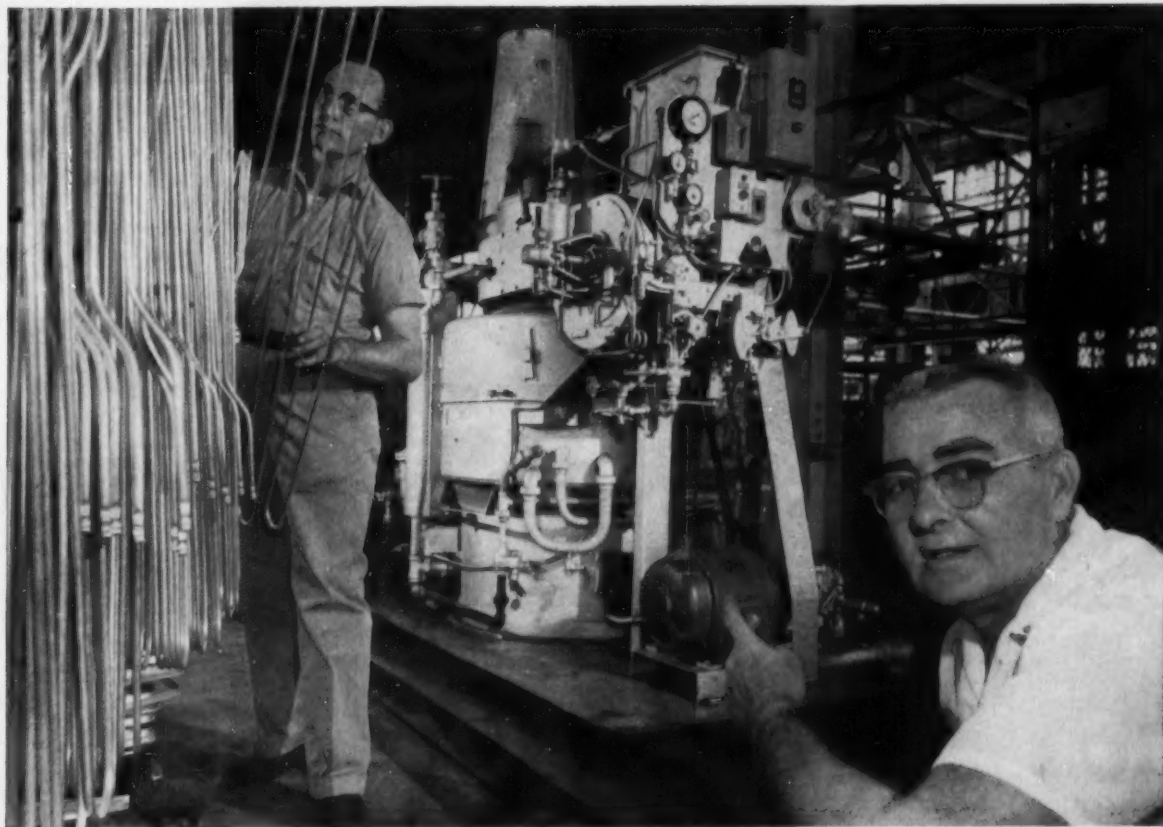
Tire Casing Keeps Rocks Out of Sheave Housing

Earl O. Hellstern of Phoenix, Ariz., has a simple way of keeping rocks out of lower sheave housings on his Model B and C Tournapulls. He cuts holes in a tire casing and threads the cable through. The tire then is bolted to the housing with $\frac{3}{8}$ -in. capscrews. This can be done by drilling and tapping the housing or by welding the heads of the bolts to it and using washers and nuts on the outside.



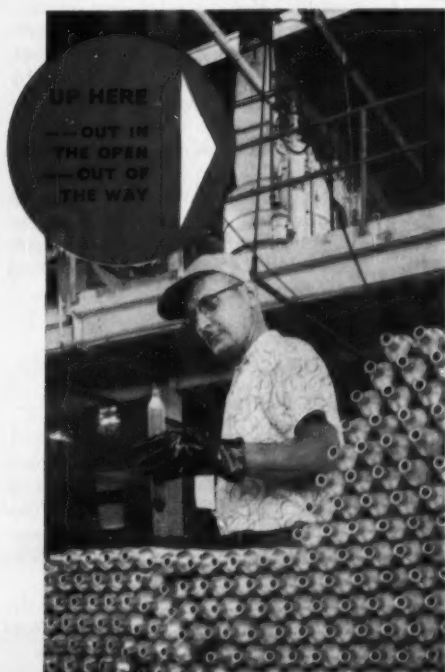
Side Teeth on Bucket Pry Pipelines Loose

Teeth welded to the sides of International Drott's Skid-Shovel are paying off for Leroy F. McGouran of Sacramento, Calif. Building fire



160 h.p. Modulatic installed on a balcony at Bohn Aluminum & Brass Corporation's Plant 13, Adrian, Michigan

MODULATIC steam generators solve space problems!



In Canada, write Vapor Car Heating Co. of Canada Ltd., 65 Dalhousie St., Montreal 3, Que.

The compact "go anywhere" Modulatic can solve your steam problems, too. It's shipped complete . . . moves through plant-type doorways . . . takes no more room than a desk and chair . . . ends early reporting and standby.

Modulatics deliver full steam in 2 minutes from cold starts . . . work anywhere, even outdoors. You have the choice of oil, gas, or combination burner—of 8 sizes to 160 h.p.—of motor or gasoline engine operation—of pressures from 2 to 285 p.s.i. Ideal for power, processing, heating. Over 13,000 already in use. Mail coupon for complete information.

VAPOR HEATING CORPORATION

80 E. Jackson Blvd., Chicago 4, Ill., Dept. J-13

Please send me free 12-page Modulatic Booklet No. 586.

Name _____ Title _____

Company _____

Street _____

City _____ Zone _____ State _____

Lays 1800 feet
of **FINISHED CURB**
per day!



**New Stephens-Canfield
AUTOMATIC CURBER**
Saves time and money
... uses no forms!

The Stephens-Canfield Automatic Curber is self-propelled and requires only three men to operate.

Simply mark out location, start the motor and fill the hopper with asphaltic or Portland Cement concrete ... compaction pressure does the rest; the operator merely guides the Curber!

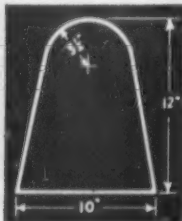
The Stephens-Canfield Automatic Curber lays straight or curved curbs on subgrade, base or finished pavement. Adjustable wheels allow this versatile Curber to be raised or lowered to permit pouring of curbing in various sizes from 6" to 12" high. Interchangeable molds provide a choice of eighteen different shapes from 6" to 12" high and 7" to 10" base width. Lays up to 1800 feet of finished curb per day, without forms! Many state highway departments are today saving time and money with the Stephens-Canfield Automatic Curber!

Write for full details and prices



E. L. HARDIN ASSOCIATES, INC.

Salisbury, North Carolina, U.S.A.



JOB TALK ...

Continued from page 14

levees at Union Oil Company's plant in California, McGouran mounted the special teeth to locate and break pipes loose. The jaws then spring the pipes from the ground.



Purifier Cleans Exhaust From LP-Gas Engines

Ready-mix concrete trucks powered by LP-gas engines are operating successfully in the Pennsylvania Turnpike's Lehigh Tunnel, thanks to a new purifier. Made by Oxy-Catalyst, Inc., the device reduces the carbon monoxide content to far less than the maximum allowable 100 ppm for 8-hr exposure. It consists of a cartridge containing 71 porcelain rods coated with an oxidation catalyst. Exhaust gases pass over the rods and are oxidized into harmless carbon dioxide.

Striated Plywood Cuts Finishing Costs

Bridge abutment forms faced with 3-ft squares of striated plywood proved their worth in two ways on a new underpass in Houston, Texas. They cut finishing costs, and they produced an attractive textured finish.

The idea originated with the Texas Highway Dept., and was carried out by Reeves & Sons of Houston. Forms were made by nailing 3/4-in. exterior grade Weldtex to 3/4-in. fir Plyform. Direction

**IT'S
Allis-Chalmers
ENGINES
for *any*
Power Need**

Make your Allis-Chalmers Engine Dealer your main source of power for all your engine needs.

He can supply a wide range of engines for any fuel — gasoline, diesel, LP gas, natural gas — for any use ... stationary or mobile-power units, fan-to-flywheel engines, generating sets or marine engines. Each has the high-efficiency, long-life characteristics necessary for continuous as well as stand-by service. With a high degree of interchangeability of parts, you can use a different type of engine for each application and yet maintain a small stock of parts.

Write for bulletins or see your Allis-Chalmers Engine Dealer for more information.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

any FUEL

DIESEL ... GASOLINE

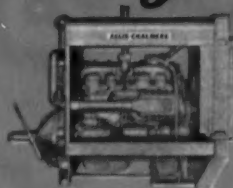
LP GAS ... NATURAL GAS

any SIZE

8 TO 616 HP



any TYPE



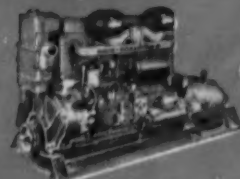
OPEN OR ENCLOSED POWER UNITS



GENERATOR SETS



FAN-TO-FLYWHEEL ENGINES



MARINE ENGINES

any USE



ALLIS-CHALMERS

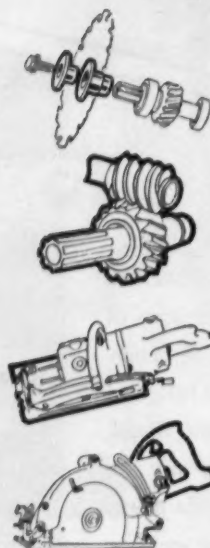


SET NEW CUTTING RECORDS WITH SKIL!

3 New Powerful Super-duty Saws in 6½", 7¼", and 8¼" Blade Sizes

These famous SKIL Super-duty Saws are especially powered to keep cutting at top speed under rugged conditions. They give smooth performance—even on problem materials like metal, stone, and compositions. Yet, for all their power, SKIL Saws are lightweight and perfectly balanced for easy, accurate handling. SKIL Saws have more safety features, too! Try the model that best meets your needs. Let it save cutting time and costs. Your SKIL Distributor will show you why more builders and contractors use SKIL Super-duty Saws than any other make!

Check these famous SKIL Super-duty Saw Features:



• **New "Vari-torque" Clutch!** A clutch that *really works!* Protection against saw damage and kick-back. Foolproof, completely dependable.

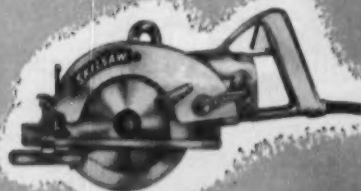
• **New, Improved Gearing!** Advanced design gives more gear contact for higher efficiency, longer service, quieter operation.

• **New Heat-Treated Aluminum Alloy Foot—40% stronger!** Remains true and accurate under hardest use. Reduces weight two-thirds!

• **New Contour Handle!** Improved to assure most comfortable grip. Avoids strain—even through steady use. (On Models 77 and 825 only.)

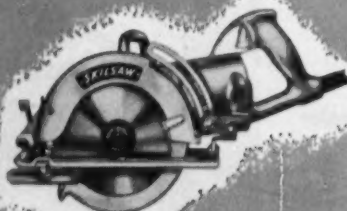
Plus these important SKIL quality advantages!

- All ball-bearing to reduce friction • Full-size top handle for control
- Blade visible at cut for accuracy • Foot design permits right or left cuts
- Sawdust blower for clear sighting • Rugged, high-speed universal motors balanced to eliminate vibration



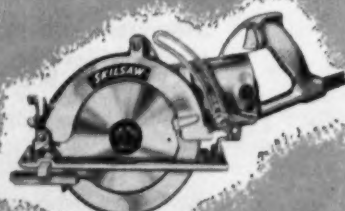
NEW 6½" MODEL 367

- Makes every residential rafter cut!
- Depth of cut at 90°, 2-3/16"; at 45°, 1-3/4"
- Free speed, 4750 r.p.m.
- Net weight, 13 lbs.



NEW 7¼" MODEL 77

- Preferred for all-around carpentry.
- Depth of cut at 90°, 2-3/8"; at 45°, 1-7/8"
- Free speed, 4500 r.p.m.
- Net weight, 15-1/2 lbs.



NEW 8¼" MODEL 825

- Ideal for residential or commercial construction.
- Depth of cut at 90°, 2-5/8"; at 45°, 2-1/8"
- Free speed, 4000 r.p.m.
- Net weight 16-1/2 lbs.

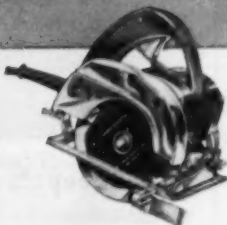
OVER ONE MILLION SKIL SAWS IN USE!



SKIL
PORTABLE TOOLS

Made only by SKIL Corporation
formerly SKILSAW, Inc.
Factory Branches in ALL Leading Cities

PLUS!
An all-new
TRIM SAW
by SKIL!



**4 1/4" Model 604 weighs just 1/2 as much
as most 6" Saws!**

The most powerful lightweight saw ever developed! Ideal as the carpenter's second saw—for slicing through roofboard, sheathing, wallboard, flooring, plywood, plaster, many other materials. Cuts vertically to 1-5/32"—bevel-cuts 1" at 45°. Rips 1" lumber. Weighs only 6 1/2 lbs.! Depth and bevel adjustments.

MAIL COUPON TODAY

SKIL Corporation, Dept. CME-106
5033 Elston Avenue, Chicago 30, Illinois

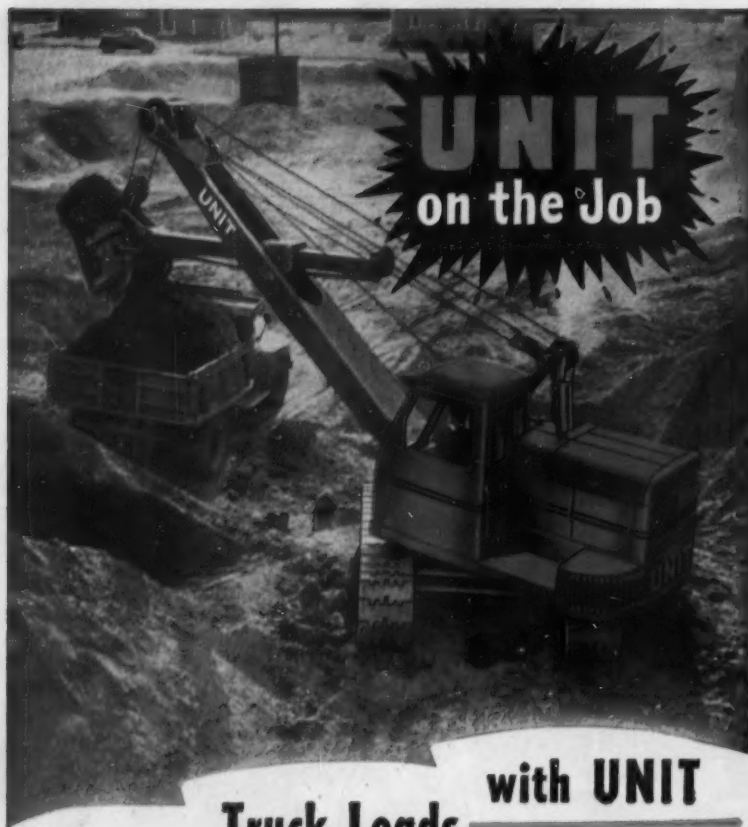
In Canada: 3601 Dundas St. West, Toronto 9, Ontario

- I would like a SKIL demonstration and FREE trial of ☐ Super Duty Saws;
☐ Model 604 Trim Saw.
— Please send literature on ☐ SKIL Super-Duty Saws;
☐ SKIL Model 604 Trim Saw.

Name

Street

City Zone State



Step-up Truck Loads with UNIT

Here's a UNIT $\frac{3}{4}$ yard Shovel that's "in there swinging" . . . making big payloads. UNIT'S balanced stability and power permit hard digging . . . produce maximum yardage at low operating cost. Fewer working parts cut down replacements required . . . reduce maintenance costs. The FULL VISION CAB enables operator to see in ALL directions . . . promotes safety . . . increases efficiency. Results in more loads per day and easier load handling. Get the complete UNIT story. Write for literature.

UNIT CRANE & SHOVEL CORPORATION
6305 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.



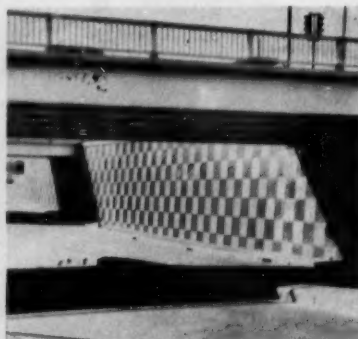
**$\frac{1}{2}$ or $\frac{3}{4}$ YARD EXCAVATORS... CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL**



All Models Convertible to ALL Attachments!

JOB TALK . . .

Continued from page 16

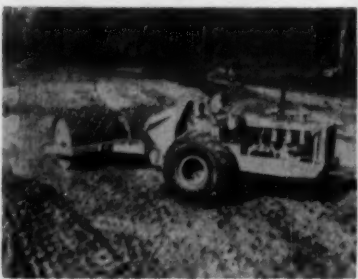


of the striations was alternated to create a checkerboard pattern. Contractor reports forms were re-used up to 13 times, and only one finisher was required instead of a conventional crew of four.



Pipe Skids Carry Compressor Over Hills

Job-made pipe skids are helping Ranier Construction Co. haul its compressors along a rugged pipeline job in Virginia's Blue Ridge Mountains. Rocky cliffs are too much for tires, but tractors easily drag the skids.



Fast Sheepfoot Rig

Faulk & Coleman Construction Co. of Tallahassee, Fla. has found a good way to speed compacting with sheepfoot rollers. They combine a roller with the prime-mover of a Super S Tournapull. It makes a fast and maneuverable rig.



DOWN TIME...ZERO

Nothing gives hose a worse beating than a pile driver. And here's hose built to take it . . . day in and day out! Thermoid Powerflex Pile Driving Hose has the brute strength that assures longer wear, fewer replacements. *You can forget about down time.* Yet Powerflex is lightweight, flexible, kink-resistant, easy to handle.

No wonder it's tough . . . look how it's made

- Heat and oil resistant tube.
- High tensile braided steel wire reinforcement prevents bursting . . . gives flexibility.
- Special pattern of the wire braid develops positive lock of tube and cover to reinforcing structure. Mechanically bonded insulating plies assure
- homogeneous body structure.
- Internal stress of the hose under pressure is completely absorbed by the wire braids, not the insulating plies.
- Tough, specially compounded cover resists abrasion and aging.

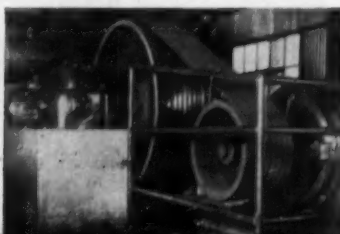
Thermoid Powerflex Pile Driving Hose is only one of many types of Thermoid hose built to give the construction industry longer service and lower operating costs. The Thermoid Distributor in your

area carries a complete line of Thermoid Hose, Multi-V Belts and Conveyor Belting, to meet the most exacting needs of every job.

Cut costs with Thermoid
Conveyor Belting . . .



. . . and Thermoid Multi-V Belts.



Thermoid

Thermoid Company, Trenton, N.J.



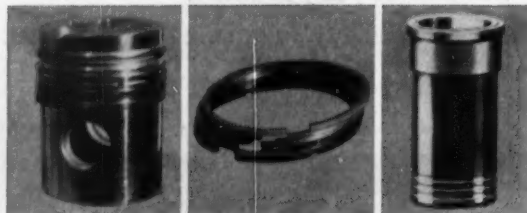
Somebody mention replacing a piston? Remember . . .

Caterpillar pistons are of special aluminum alloy—light, yet extremely heat-resistant and strong. CAT* rings are cast from fine grain alloy iron; their honed sides and lapped faces mean better sealing, smoother break-in. Chrome-plated rings offer increased resistance to wear. And 21 complete quality-control checks insure the fit, performance and long life of each Cat liner. You're sure of top quality, throughout.

With substitute parts, can you be sure of anything?

Better see your Caterpillar Dealer's Parts Representative—and get Cat original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

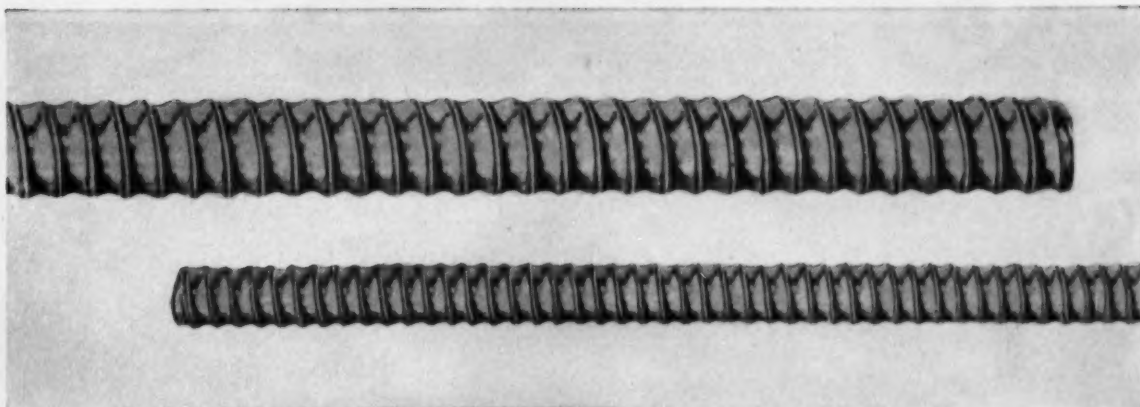


Cat pistons, rings and liners are the result of years of Caterpillar experience and research. Their thousands of trouble-free working hours can cut your operating costs substantially. Why take a chance with substitutes?

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



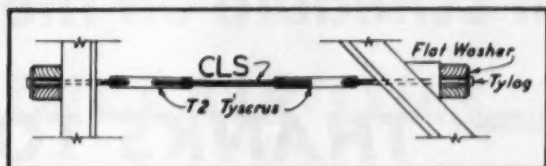


Richmond Continuous Threaded Lagstuds; available in 1/2" to 1 1/4" dia.

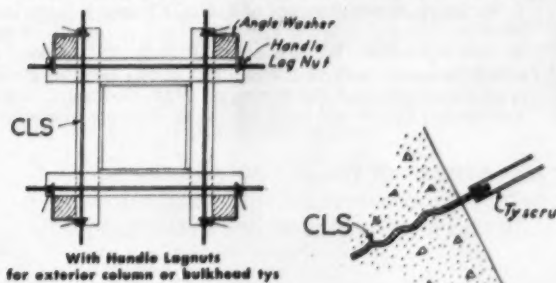
Concrete Form Tying Headaches Solved on-the-spot with Multi-Purpose Richmond Lagstuds

15% of concrete form tying work is "special"—hinging on conditions which develop as the job moves along. Before Richmond developed its Continuous Threaded Lagstud Rods, those special conditions were costly headaches. They always had meant lost man hours while, "special" tys were built or "special" orders were filled.

With a supply of Richmond's Continuous Threaded Lagstuds on hand, now any job foreman can have the needed sizes quickly cut to length on the spot. They come in 1/2-inch, 3/4-inch, 1-inch and 1 1/4-inch diameters, threaded to fit the contour of the coil (helix) of the Tyscru; in 5-ft. and 10-ft. lengths.



Lagstuds are among the most versatile members of the Richmond Tyscru family. Used alone, or in combination with other Tyscru products, they fill numerous other needs. Some of these uses are illustrated here.

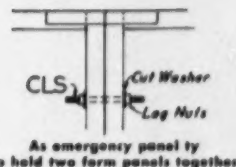


With Handle Lagnuts for exterior column or bulkhead ties

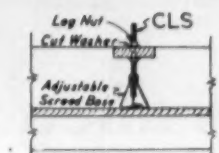
When furnished crimped, as anchorage to concrete where additional anchorage is needed in winter or below-strength concrete



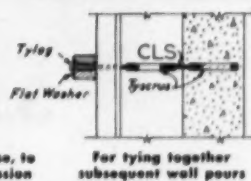
As anchorage for tying back forms to previous lift



As emergency panel tie to hold two form panels together



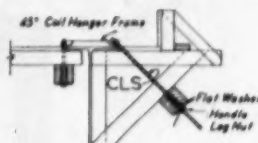
With Richmond's Adjustable Screed Base, to support a block form for a curb depression



For tying together subsequent wall pours



Grouted into rock—as anchorage for wall-facing pours and brackets



With a 45° Hanger Frame-Ty on the fascia beam of a bridge



With Handle Lagnut and flat washer as an emergency Ty-lag substitute

The new Richmond Handbook describes the Richmond Adjustable Tyscru System and the entire Richmond line in detail. It is yours for the asking. To get it—or for help in solving a particular concreting problem—write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N.Y. or 315 So. Fourth St., Saint Joseph, Mo.





35% ahead of schedule on the

THANKS TO



J. W. Smith, Superintendent of J. C. O'Connor & Sons, Inc., reports: "Sinclair Oils and Greases played an important part in this operation. We are approximately 35% ahead of schedule—and most of the equipment has been in almost continuous use since the Spring of 1955. Downtime due to mechanical failure has been held to an absolute minimum."

SINCLAIR LUBRICANTS



Indiana Turnpike...

SINCLAIR OILS AND GREASES!

For an outstanding job on the Indiana Turnpike, J. C. O'Connor & Sons, Inc., contractors, share the credit with Sinclair.

Delwin Libby, Grade Superintendent, says: "We have moved just under 3,000,000 yards of sand in seven months. This project has been done using a minimum of types and grades of oils and greases. The result has been a reduction in lubrication inventory, savings in labor, lessening the danger of misapplication, and *no failures due to lubrication*. Sinclair's cooperation has been of great value in helping us make this record."

You too can rely on Sinclair for dependable products and service. Just call your nearest Sinclair representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation!*

for every construction need

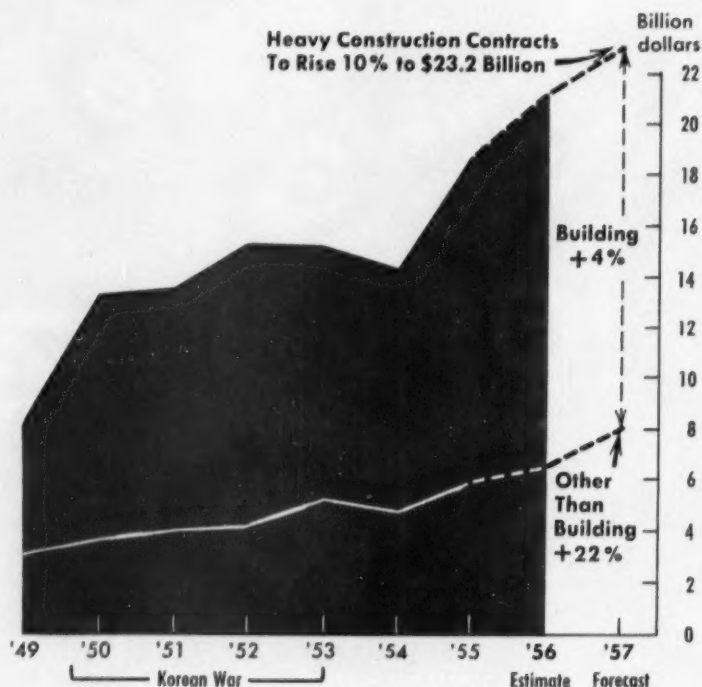
It's Your Business . . .

1957 Forecast:

• Record \$23.2 Billion In Heavy Construction Contracts

• Contractors Doing Other Than Building To Have Biggest Increase in New Business

Type of Work	1956 Estimate (Millions)	1957 Prelim. Forecast (Millions)	% Change '55-'56	% Change '56-'57
Other Than Building . . .	\$6,620	\$8,100	+11%	+22%
Waterworks . . .	360	390	+15	+8
Sewerage . . .	600	600	+49	0
Bridges . . .	600	725	+10	+21
Highways . . .	2,500	3,200	+17	+28
Earthwork, Irrig. & Drainage . . .	700	930	+28	+33
Unclassified—				
Public . . .	1,010	1,170	-10	+16
Private . . .	850	1,085	-8	+28
Building . . .	14,575	15,120	+14	+4
Public, Excl. Hsg. . .	2,000	1,900	+15	-5
Pub. Housing . . .	275	285	+12	+4
Private—				
Industrial . . .	5,100	4,800	+73	-6
Housing . . .	5,500	6,275	-10	+14
Commercial . . .	1,700	1,860	+3	+9
Total . . .	\$21,195	\$23,220	+13	+10



New Business to Increase 10% Next Year

Heavy construction contractors can look forward to a record volume of new business in 1957. CM&E's preliminary estimate puts next year's total contract awards at \$23.2 billion. This is 10% higher than the \$21.2 billion in heavy construction awards estimated for this year. Moreover, it's 24% more than 1955's dollar value of awards and a thumping 60% higher than 1954.

Contractors active in heavy construction other than buildings have the brightest outlook for next year, according to CM&E's forecast. Total awards are expected to climb 22% above 1956 for this broad type of work—which includes highways, bridges, waterworks, sewerage, dams, and airports. The 1957 contract volume for this other-than-building heavy construction is forecast to top the \$8-billion mark for the first time in history.

The table above shows the prime movers in this record volume of

new work to be highways, forecast to rise 28%; bridges, up 21%; earthwork-irrigation-drainage, up 33%; and private unclassified, up 28% (mainly pipelines, privately-owned hydro-electric power plants, and transmission lines.)

Also contributing to the rise will be federal military airbase and waterworks awards. Sewerage contracts should match this year's record, which is estimated at 49% over 1955.

Smaller Rise for Buildings

Building construction awards will also rise in 1957, but the 4% gain forecast by CM&E is much smaller than the rise in other types of heavy construction. A 6% decline in industrial building contracts and a dip in publicly-owned buildings will be offset by a rise in mass housing and commercial buildings.

However, there's a joker in the

higher volumes expected for housing and commercial building contracts. All of the increase will be due to federally sponsored programs: "Capehart" housing to provide privately-owned and financed rental units at defense and defense-related installations; and the federal lease purchase program for privately-owned and financed post offices and office buildings. Without these federal programs, private housing and commercial building contracts would be forecast at lower levels than this year.

School construction is expected to rise next year, but the increase will be moderate because of uncertainty about the proposed federal aid to schools program and because bond financing will continue to have rough going. Some municipalities, unable to sell new bond issues, will be forced to postpone contract awards until financing can be arranged.

Continued on page 30

"3 REASONS WHY WE USE CAT* ENGINES:



- 1** All the power we need to do the job easily.
- 2** Maximum dependability with minimum good care.
- 3** Operators prefer Cat power to work with."

NELSON ARMSTRONG, Supt.
Maxwell Bridge Co.

Those three reasons tell why Maxwell Bridge Co., of Columbus, Kansas, powers its cranes and excavators with Caterpillar Diesel Engines. The Koehring Crane shown here, placing I-beams for a bridge 5 miles west of Emporia, is one of 12 machines owned by Maxwell. Its engine? A Caterpillar D318, with well over 4000 hours on the meter.

Operators who have worked for this company from 8 to 25 years are particular about their power. Busy all year around, each man services his own machine. Naturally they want an engine that stays on the job without tinkering—and when they're asked to name their preference, they choose Caterpillar.

Most manufacturers of excavating equipment can supply Cat Diesels as original power. Or Caterpillar Dealers are ready to install these dependable engines

as replacement power. A full line of engines is available. The D318, for example, is rated at 137 HP (maximum) at 2000 RPM.

For the power you need and for service and parts you can trust, call your Caterpillar Dealer. He's as near as your telephone.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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**MODERN HEAVY-DUTY
DIESEL ENGINES**



**Good news to a
profit-minded
contractor**



Estimated 30 days FINISHED IN 12!

That's the kind of news every contractor likes to hear. And that's the kind of performance record BAY CITY is associated with more and more, on job after job. For instance, the estimate of 30 days on excavating to a depth of 25 feet in Ohio blue shale was cut to 12 days by Tom Simich & Sons Construction Company, one of the leading sewer and water contractors of Cleveland. He was using a BAY CITY 1½ yard Hoe with 54 inch dipper. Join the growing ranks of "profit-minded" contractors who are using BAY CITY excavating and material handling equipment—either crawler or rubber tire mounted. Take the first step today by writing for Catalog—no obligation, of course.

BAY CITY SHOVELS INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



253

BIG-Without BULK!



New 900 cfm

AIRVANE Rotary

Here's a 900 cfm portable compressor that is only 12 feet long—that has a 14'10" turning radius—that is ruggedly built of high-strength steel—yet weighs as much as 3700 pounds less than other 900 cfm portables.

The new Joy 900 cfm AIRVANE rotary tows and maneuvers like ordinary 600 ft. machines, yet packs enough punch to power three heavy wagon drills . . . or seven light wagon drills . . . or ten hand-held drills.

EXCLUSIVE AIRVANE FEATURES:

THERMAL BY-PASS—an oil circulating system that provides immediate lubrication and temperature control under all weather conditions.

SPLINE COUPLING—does away with a clutch for more efficient power transmission.

Consult a Joy Engineer

for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS
CORE DRILLS • BLAST HOLE DRILLS
PORTABLE HOISTS • FANS • BLOWERS • TUNNEL,
QUARRY, MINE EQUIPMENT

If a 900 ft. portable is in your plans to push along a tough job, better look at the latest—then put a JOY on the job.

Write today for full information. Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

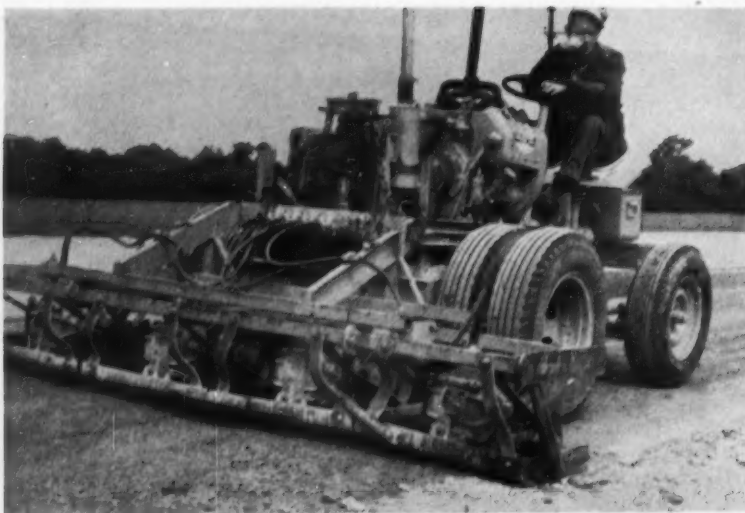
Write for FREE Bulletin 129-23

WSW 66276-159

JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY





JACKSON MULTIPLE COMPACTOR PROVED ON HUNDREDS OF PROJECTS

THE FASTEST, MOST ECONOMICAL AND VERSATILE MACHINE FOR OBTAINING 100% OF REQUIRED DENSITIES IN GRANULAR SOIL BASES, SUB-BASES AND ALL MATERIALS NORMALLY USED IN MACADAM BASES AND PAVEMENT WIDENING PROJECTS . . . LARGE FILLS AND SIMILAR JOBS. EACH OF THE SIX UNITS IN STANDARD WORKHEAD DELIVERS 4200 TWO-TON BLOWS PER MINUTE.

The Jackson Multiple will save you many, many times its cost in time and money. See it at your nearby distributor. His name and literature on request.



The photo above shows the perfect adaptability of the Jackson Multiple Compactor to pavement widening by grouping and towing individual compacting units at the side of tractor for one-pass, complete consolidation on practically every project. At left, see how the end unit on a base compacting job assumes the correct position without adjustment to contain and compact the base edge simultaneously with horizontal base compaction.

Furthermore, individual units may be fitted with operating handles and used exactly like the highly popular, standard Jackson Manually Guided Compactors for getting into the tight places that no other mechanical compactors will reach.



JACKSON VIBRATORS, INC. LUDINGTON MICHIGAN

IT'S YOUR BUSINESS . . .

continued from page 26

Money Lever

This forecast of 1957 new business makes a key assumption: money will continue tight next year. Such a condition means that shortages of mortgage money for financing houses and commercial building will cause postponement of some projects. Also, some state or municipal projects, depending on bond sales for financing, will have to be delayed until there are takers for the bond issue.

During 1956, industry put tremendous pressure on banks and institutional lenders like insurance companies and pension funds for money to finance its record expansion program. These lenders diverted money which otherwise would have gone into mortgages or purchases of municipal bonds, into industrial bonds and loans where the interest was much more than offered by home mortgages or municipal bonds.

As long as industry continues to take the lion's share of what lenders have to invest, other borrowers will stay in the back seat. This means that some construction—other than industrial and federal projects—will find the going rough when the owners have to borrow money to get work started.

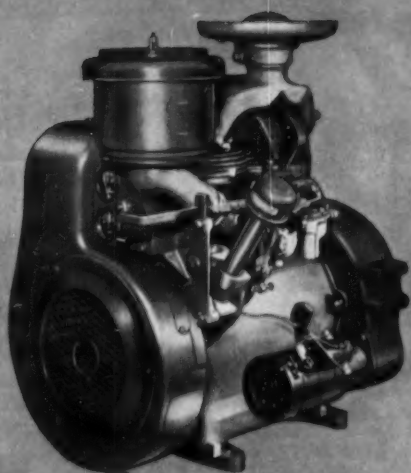
Interest rates shot up in 1956 and, so far, there are no prospects of a decline in borrowing costs. In fact, borrowing could become even more expensive next year. Some public agencies are restricted by law from paying above set maximum interest rates. FHA and VA home mortgages have maximum interest rate of 4½%. Restricted rates like these can't compete with others which are free to go up. But even if they could rise, it's questionable whether much more money would become available to these borrowers simply because there apparently isn't enough money to go around.

Competitive Year Ahead

While dollar value of contract awards is forecast to rise 10% next year, part of the rise will be caused by price increases. CM&E sees an average 3.5% rise in materials and labor costs next year, and this increase is included in the 1957 figures. Contractors will pass on these cost increases in higher prices to their customers.

Continued on page 34

ONE
.....
ENGINE



with a
knack for
all trades!

The FULL POWER LYCOMING C2-90

Air-Cooled! Rated 30 h.p.—Delivers 30 h.p.!

Here's the tough, versatile engine that has an amazing variety of applications. And in this variety, the C2-90 is exposed to the most exacting working conditions . . . tested and proven in the field.

This amazing 30 h.p. unit offers you:

- The traditional air-cooled advantages of lighter weight, lower cost, all-weather performance, and superior endurance.
- **FULL POWER** performance—rated at 30 h.p.—*delivers* 30 h.p.!
- Highest horsepower and torque per cu. in. displacement in air-cooled field.
- Complete interchangeability—identical mounting and shaft dimensions with other major air-cooled industrial engine units in horsepower range.
- Reliability and simplicity for *easy* maintenance.

Yes! This engine does just what we say it will do. That's why it has been chosen by leading equipment manufacturers like those in the applications illustrated. Find out how Lycoming's 45 years of engine-building experience can solve your problems. Write:

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The record of GALION Graders and Rollers for living up to performance and economy promises is a long and honored one.

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Costs of city work seem too high?

LOOK HOW SANGAMO CONSTRUCTION CO. CUTS THEM

This well-known 30-year-old Springfield (Illinois) firm, a year ago, had a problem common to most city-area contractors. Moving costs and traffic slow-downs were taking much of the profit out of their municipal work. Small, extra, one-day or weekend jobs, which *could* have built income, often couldn't be handled because their equipment was either too small or too big. Sangamo, however, found a solution. They bought three Michigan Tractor Shovels.

ability is vital in speeding completion. Preceding photograph shows typical task of this type—laying eight miles of 8, 10, and 12-inch sewer pipe for the city of Decatur (Illinois). Daily—almost hourly—this Model 75A shuttled between *three* crews. Tasks included pushing spoil away from trencher . . . back-filling . . . transporting and laying pipe. At times, it set manholes weighing 1200 to 1500 lbs per ring section. Biggest advantages proved to be speed (a typical half-mile trip took 75 seconds) . . . rugged construction (in a summer of work, no time was lost from the job for repairs) . . . planetary axles (which eliminated all axle breakage despite rugged lifting demands).



**Drive, turn non-stop
on narrowest city streets**

All these units can be on their way to any kind of loader job in minutes. "These rigs go anywhere," says Clyde Turner, one of Sangamo's job superintendents. "They can run three or four blocks, through auto and truck traffic, in a minute or so. Twenty-seven miles takes only an hour. Rubber tires don't tear up asphalt or oil-mat pavement. They can even go up on a sidewalk without breaking it or the curbing. And our Model 75A's (which are 6' 8" wide and 16' 10" long) can turn around non-stop on the narrowest city streets."



**Carries 1800 lb
water main section**

Bigger loads have been no problem for the Michigans, either. Above, the second of Sangamo's 80 hp Model 75A's carries an 1,800 lb, 18 ft section of 20 inch water main. This unit *can* lift 8,000 lbs while standing still . . . can carry 4,000 lbs at 4 mph.

**Clears, loads 1,000 yards
of rubble in 1½ days**

Sangamo's third Michigan Tractor Shovel, a 95 hp, 1¾ yard Model 125A, also handles assignments where speed is important. Here it's on a historical job in Springfield—clearing the wreckage of Illinois' first governor's mansion to make way for a parking lot. Entire 1,000 cubic yards of rubble and dirt was piled and loaded out in 1½ days. Sangamo Construction bought this machine, their first Michigan Tractor Shovel, after having it demonstrated (to quote Company President, Bill Kewley) "on the toughest tractor shovel work we could find—digging up wet rocky ground to improve drainage around a Springfield sewage treatment plant. Later," Kewley contin-



ues, "it proved so handy and so dependable, all our crews wanted one. So, in 5 months, we bought our second Michigan, and, 3 months later, our third."

Stockpiling gravel is another job for the busy Model 125A. While at this city-located yard, rig sometimes loads trucks and railroad cars, feeds the crusher, does cleanup. Its standard 1¾ yard bucket, incidentally, is interchangeable with 2 yard light-material bucket. The model 75A's standard 1 yard bucket inter-



changes with ¾ and 1½ yard sizes. Both models can also be equipped with crane hooks, fork lifts, backfiller blades, scarifiers and root rakes. For small jobs, you can get a Michigan Model 12B with 6, 10, 15, 20, or 27 cubic foot capacity . . . for big jobs you can get a Michigan Model 175A with 1¾, 2, 2¼ (standard), 3 or 5 cubic yard capacity.

Michigan is a Registered trade-mark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 35, Michigan

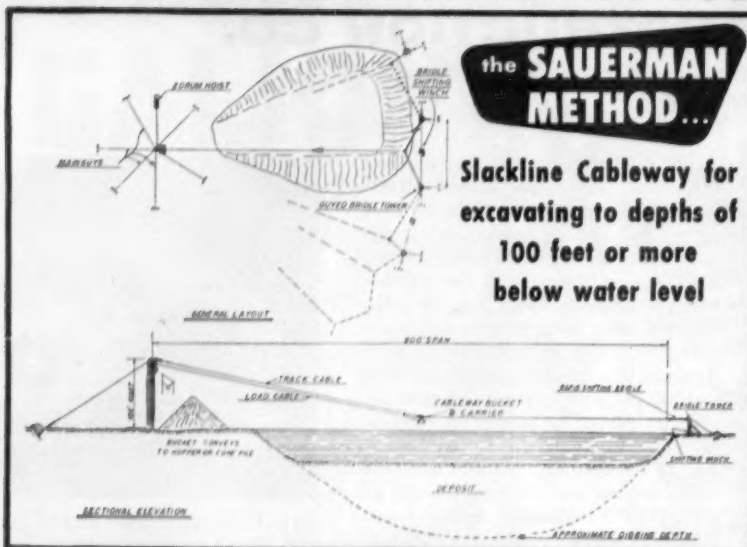
**CLARK[®]
EQUIPMENT**



**Does job of bigger machines
setting 12 inch sewer pipe**

Often, one of the Michigans is assigned to a major job where maneuver-

HOW TO DO A BETTER UNDERWATER EXCAVATING JOB



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridge is not needed for many deposits.



Cableway at Cabinet Gorge Dam digs and hauls from tailrace 1000 ft. away. (Full details in Sauerman News No. 143.)



New York gravel producer switched to cableway for underwater operation of his pit. Average haul is 600 ft. from a 50-ft. depth (Sauerman News No. 141).

You can remove more underwater material with a long reaching Sauerman Slackline Cableway. On job after job this machine has proved to be the most efficient for this type of operation. It is especially effective where the material to be excavated has good depth and will flow to the bottom of the cut. For shallow deposits or non-caving material a rapid shifting device is used to change the line of operation.

One man controlling the hoist digs, conveys and elevates from deposit to plant over spans of 1000 ft. or more . . . across streams, lakes, bogs or deep pits. The powerful load line pull insures digging penetration. Tensioning the track cable lifts the bucket which is inhailed at high speed and dumps automatically. Gravity return completes the fast operating cycle. Bucket capacities range from $\frac{1}{2}$ to $3\frac{1}{2}$ cu. yds.

To get fast, economical long range excavation, and the shortest, most direct way from pit to pile use a slackline cableway. Contact Sauerman for specific recommendations. No obligation. Request Catalog C, showing detailed specifications and photos of slackline cableways in action on all types of deep digging jobs.

SAUERMAN BROS. INC.

612 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks.

IT'S YOUR BUSINESS . . .
continued from page 32

Taking the effects of the cost increases out of the forecast figures gives a 6% increase in the "real" or "physical" volume of new work. Contractors will be able to handle this increase without batting an eye, except in the direction of steel and cement suppliers. That's because their total capacity for work has grown faster than the increase in new work. New construction equipment purchases alone have accounted for a very large increase in contractor capacity, especially since 1955.

So it's not surprising that most contractors see competition remaining keen or getting even stiffer next year. An AGC survey of its members last month showed that 43% expect competition to increase during the first part of next year. About 51% see no change from the present situation, which AGC spokesmen interpret as a sign that work is so competitive now that "it could hardly become more so." Less than 7% of contractors answering AGC's query expect competition to lessen.

Useful Information

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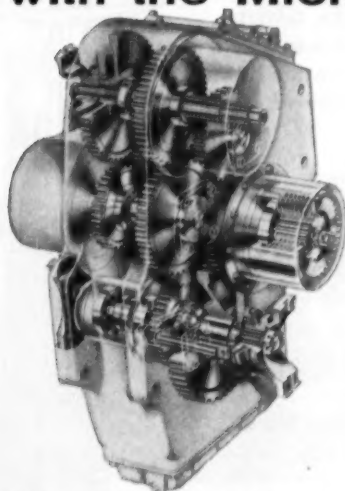
Send your request to:

Editor, Construction Methods & Equipment, 330 West 42nd Street, New York 36, N. Y.



Michigan's speed boosts output even on toughest assignments. Top is 27 mph. Photo comes from job near Duluth, Minnesota.

You'll cut your dozing time with the Michigan Power-Shift Transmission



Operating a Michigan Tractor Dozer is both fast and easy. Gone is the old-fashioned heavy-duty foot clutch; gone is the tiresome work of clutching every time you shift gears.

The Michigan Power-Shift Transmission does *all* the work for you. All you do is operate finger-tip hand levers on the steering column . . . one for Forward-Reverse, one for High-Low speed. *Make either shift while moving in either direction without coming to a stop.* Doze material where you want it, flick the lever, and almost instantly back up. Torque converter takes up *all* shocks . . . so you speed operations, cut

dozing time, get top yardage every day.

For proof, get a demonstration right on your own job. It is easily arranged: just phone your Michigan distributor. Ask him, too, about the Clark Leasing Plan which lets you put a Michigan Tractor Dozer, Michigan Tractor Shovel, or Michigan Excavator Crane on your job without paying out a cent of capital.

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Construction Machinery Division
2403 Pipestone Road
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Here's the secret of Big Time-Savings: the Michigan Power-Shift Transmission! Forward-Reverse and High-Low gears are in constant mesh. Shifting is accomplished by hydraulic pressure. Power-shift levers on steering column actuate control valves in transmission. These valves direct oil pressure to multiple-disc clutches which transmit engine power from selected drive gear to output shaft. Hydraulic oil completely lubricates all drive gears and bearings as it flows from top to bottom, returning to sump through fine-mesh screen.

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EQUIPMENT

GASOLINE **BARCO** RAMMER



AIR FIELD TRENCH WORK



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The Key to Better Construction!

NO RECENT TREND in construction has had a more phenomenal growth than the specification of **HIGH DEGREE SOIL COMPACTION** for all kinds of projects—Atomic Energy, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Airports, Bridges, Buildings, and Housing Developments! The increase in the use of Barco Rammers on these jobs has been equally great.

Easily meets rigid specifications—

In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—**EASILY! EFFICIENTLY! ECONOMICALLY!** The Barco Rammer is especially useful for compacting fill in

restricted areas—close to walls, culverts, abutments, around footings, and in trenches. **ONLY** the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

Gets jobs finished on time—

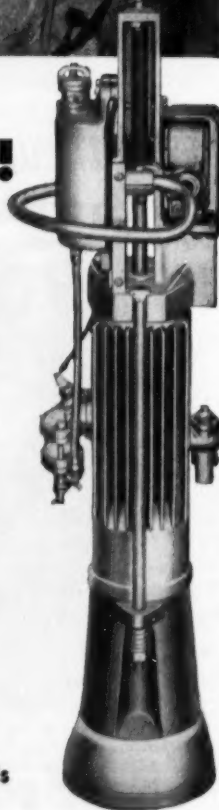
One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

Barco performance pays dividends! We will be glad to arrange a demonstration for you—see our nearest dealer or write.

BARCO MANUFACTURING CO.

BARCO

512L Hough Street, Barrington, Illinois



Two miles of travel over muddy right-of-way failed to keep this new Michigan crane from its bridge-building job on Super Highway 66. Section about to be lifted weighs 18½ tons.



6 x 6 drive, big tires, all-Clark power-train standard

New Michigan truck-crane goes anywhere to handle lifts up to 25 tons

Like the owner pictured, your job requirements may take your cranes through some pretty tough going. It's not always easy... not even for the all-new 25-ton Michigan Model T-24 truck crane. However, this unit is

probably *better equipped* for rugged going than any other.

Speeds from 1.6 to 39.0 mph

It gives you, as standard equipment, all-wheel 6 x 6 drive. It rides on 11.00 x 20, 12-ply high-flotation, high-traction tires. For travel through spongy or sandy footing, it has a low, low speed of 1.6 mph. It can go almost anywhere.

Frame all-Manten steel

It can work almost anywhere, too. Its truck frame is built of high-strength Manten alloy steel to stand up under the shocks and strains of heavy-duty service. Side-channels and cross-members are deep-penetrated submerged-arc-welded into a rugged integral unit. The truck alone weighs 27,000 lbs. Clark planetary wheel axles are standard, too, both front and rear. These axles, the result of over 50 years experience by Clark in the design and manufacture of heavy-duty axles, pro-

vide a 3-to-1 reduction in the wheel hubs. This reduces axle torque by 70%, eliminating axle breakage. Static load rating of the tandem rear axle is 90,000 lbs.! Static load rating of the front steering drive axle is 30,000 lbs.!

Call us for all the facts

This new time-saving, go-anywhere truck crane is now available. Talk to your local Michigan Distributor about it. He can put one on your job under the popular Clark Lease-Purchase Plan, without your paying a penny down.



For highway travel, the new Michigan Model T-24 quickly strips to 41,500 lbs. gvw, well within weight limitations. All you do is remove counterweight, rear outrigger under power, then unpin boom. All-wheel air brakes, power steer, vision through 2,775 sq. in. of safety-glass window make top speed of 39 mph absolutely safe.

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**CLARK®
EQUIPMENT**

Big bridge gets a steaming hot beauty bath



High Pressure Cleaner made by Mainbar Manufacturing Co., Oakland, Calif.

A typical example of B. F. Goodrich improvement in rubber

To get this 8½-mile-long bridge ready for painting, workmen blast layers of dirt, grease and salt off the metal with high-powered jets of superhot solution. It used to be plenty dangerous. Imagine what would happen to a workman, high up on the scaffold, if a high-pressure steam hose should burst!

And heat used to weaken steam hose. Sometimes it burst at the weakest spot, with explosive force, spraying scalding steam in all directions.

B. F. Goodrich men believed a hose could be made completely *burstproof*. They designed one with layers of fine braided steel wire, then layers of a new kind of heat-resisting rubber, inside, outside and between the braids. Not one length of this hose has ever been known to burst. Even if a hose wears out after years of service, steam can leak out but it cannot explode.

This B. F. Goodrich hose not only stands heat better but wears better. On job after job it has lasted 4 and 5 times longer than other steam hose. Its rubber cover resists abrasion better than steel. It's 30 per cent lighter than steam hose used to be, more flexible, easier to handle.

B. F. Goodrich has made hundreds of improvements in dozens of kinds of hose to make them last longer, cost less, save your time and money. B. F. Goodrich makes hose to carry almost anything—air hose that stands sharp flying rocks outside and hot oil inside, furnace door hose that stands 3000 degree temperatures, hose that lasts for years carrying gasoline, paints, chemicals, even dry materials such as flour or cement.

Call your B. F. Goodrich distributor for more information about any kind of hose, belting or other rubber products. B. F. Goodrich Industrial Products Co., Dept. M-759, Akron 18, Ohio.

B.F. Goodrich

INDUSTRIAL PRODUCTS



Cranes Outflank Soft Sand

• Paving this section of the Indiana Toll Road near East Gary requires extra effort. The sand material in the 40-ft median strip is so soft and unstable that batch trucks cannot cross from one lane to the other. So Peter Kiewit Sons' Co. and Condon-Cunningham Co., joint venture contractor for this section, set up two Koehring 34E pavers on the opposite slab and swing concrete buckets across the divider strip with Northwest No. 6 cranes. The laydown buckets are job-made except for their Garbro gates. The contractor found it necessary to pour about 100,000 sq yd of the 10-in. slab on a 5.2-mi section of the highway by this method. The new 156-mi Indiana Toll Road is scheduled to open next month. It will form the final link in the chain of turnpikes connecting Chicago with New York.

For fast, low cost liquid new design BUTLER

NEW payload power...NEW handling ease

Here's the asphalt transport that gives important saving in time and money to operators of asphalt plants and road contractors alike! A new lightweight design by Butler, manufacturer of a complete line of high capacity liquid transports, makes this asphalt transport 3000 lbs. lighter than most units only three years old! This means *hundreds more gallons* legal payload per haul, fewer trips to the refinery and field, fewer miles to drive to make deliveries, less investment in extra rigs. And, with direct control of your asphalt transportation, you can be sure of dependable, on-time deliveries exactly when you need them.

Butler's new asphalt transport is especially con-

structed to withstand and maintain the 400°F. temperature at which most liquid asphalt is delivered. The tank is covered with two inches of glass fiber insulation and then sheathed with a steel or aluminum jacket. The use of aluminum—an optional feature with Butler—saves over 800 lbs. and adds that much more to your payload.

For easy cleaning and maintenance, the tank is a single compartment. Drivers say the transport is easy to handle and, because of its round shape, has good visibility to the rear.

Send for all of the important details of this new development in asphalt transports. Mail the coupon at right.

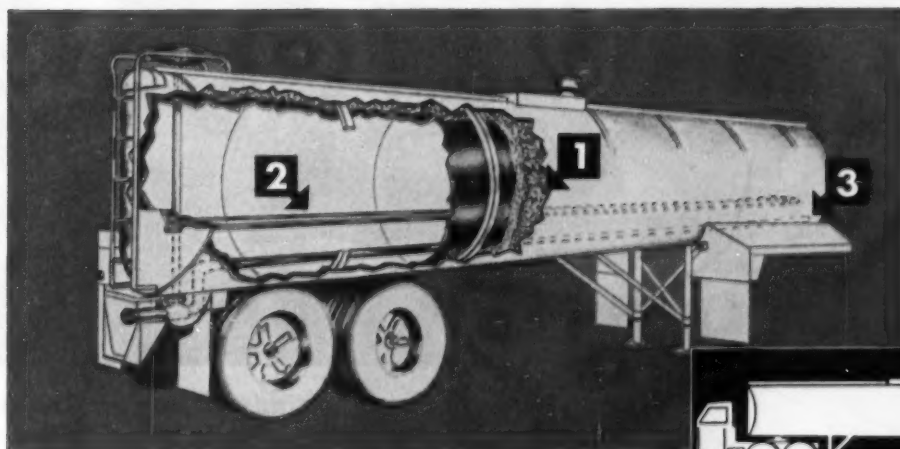


New design 6075 gallon Butler Asphalt Transport for use in Illinois. Butler has made asphalt transports as large as 6500 gallons for areas with high gross weight limits.

asphalt deliveries...

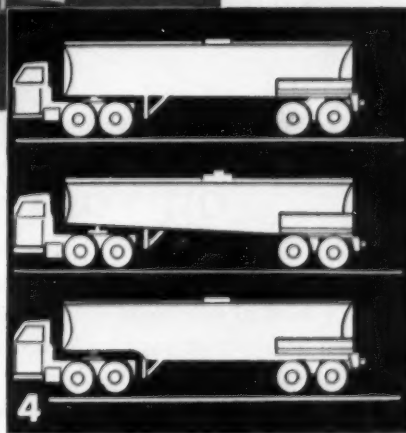
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...NEW low-maintenance construction



Optional Features to Fit Butler Asphalt Transports to Your Operations

- 1** Steel or high payload aluminum jackets
- 2** Fire tubes or steam coils inside tank to maintain asphalt temperature on long hauls
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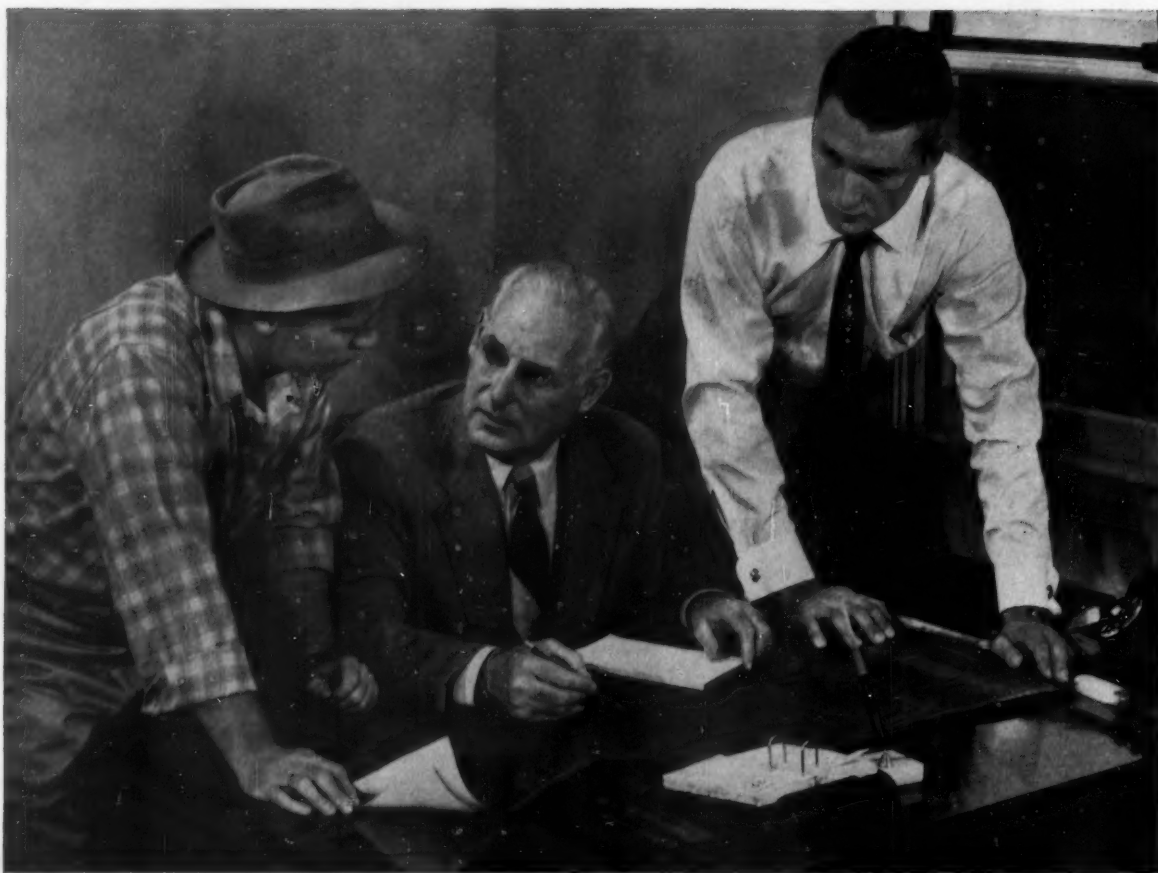
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Construction News in Pictures . . .

Planned for Speed

Heavy grids bridge the median strip of the Kansas Turnpike to let trucks hauling hot mix pass from one side to the other. And working three Barber-Greene finishers in tandem insures hot joints between strips. San Ore Construction Co., McPherson, Kans., is the contractor.



Excavating the Channel

Earth-dike cofferdam outlines the future channel of the St. Lawrence Seaway below Cote Ste. Catherine Lock. Loop at upper left is for turning basin. Top of dike provides Walsh Canadian Construction Co., Ltd., with roadway for equipment on the job. Dike later will be cut away.



Extra Handling

Gasoline winch mounted on top of the crane's cab provides two additional drums for handling jet lines when the crane handles piles. Cleary Brothers Construction Co., West Palm Beach, Fla., is contractor for the pair of twin bridges over a canal on Florida's Sunshine State Parkway.

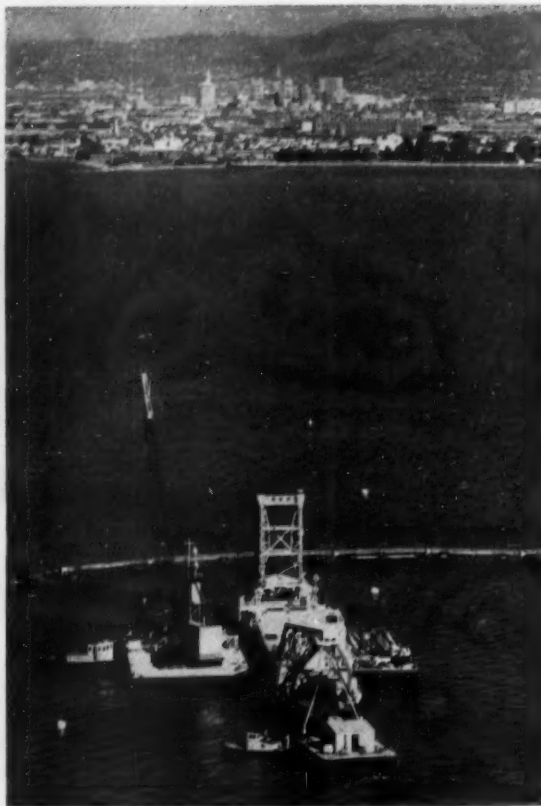


(Continued on next page)



Easy to Handle

Collapsible rubber tank for storing oil, water, or other liquids measures 45 x 11 x 6 ft when filled to its 15,000-gal capacity, but rolls up like a sleeping bag into a package 8 ft long and 2½ ft in dia when empty. Firestone Tire & Rubber Co. manufactures the rubberized nylon tanks at its Magnolia, Ark., plant.



Dredging Fill

The big dredge, "Franciscan", is pumping 1,000,000 cu yd of sand a month from the bottom of San Francisco Bay to a landfill alongside Alameda, Calif. By the first of next year, it will have placed a total of 11,000,000 cu yd on which Utah Construction Co. will build a community of 1,300 homes.



Mackinac Steel

Two barge-mounted Manitowoc 80-ton capacity cranes set the steel structure for the south approach to the \$80 million Mackinac Bridge. American Bridge Division of U. S. Steel Corp. is building the superstructure of the bridge under a \$44.5 million contract. When completed late next year, it will be the world's longest suspension bridge with a center span of 3,800 ft.



JOHN DEERE Utility Tractor and Equipment

... ONE Basic Unit ...
All These Attachments!

IT'S like eating your cake and having it, too—the way a John Deere Utility Tractor and working equipment will step up the amount of work you can do without increasing your costs.

No matter what make of tractor you are now using—or what tractors you have operated in the past—we believe you will agree you never saw a tractor and equipment that will do so much work, pound for pound, dollar for dollar.

You don't pay for a lot of extras—features like Touch-o-matic hydraulic equipment control, heavy-duty 3-point hitch, and comfortable spring-cushion operator's seat are built right in—yours at no extra cost.

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TRENCHING 8 MILES through hard shale at Little Rock Air Force Base at Jacksonville, Arkansas, the powerful American Backhoe turned out steady production without costly maintenance delays. "Our American chewed through

that hard shale day in and day out without a single hour of downtime," Bruce Bird, Project Engineer, says. After trenching, concrete storm drain pipes from 12 to 96-inch diameters were placed atop 20 inches of tamped backfill.

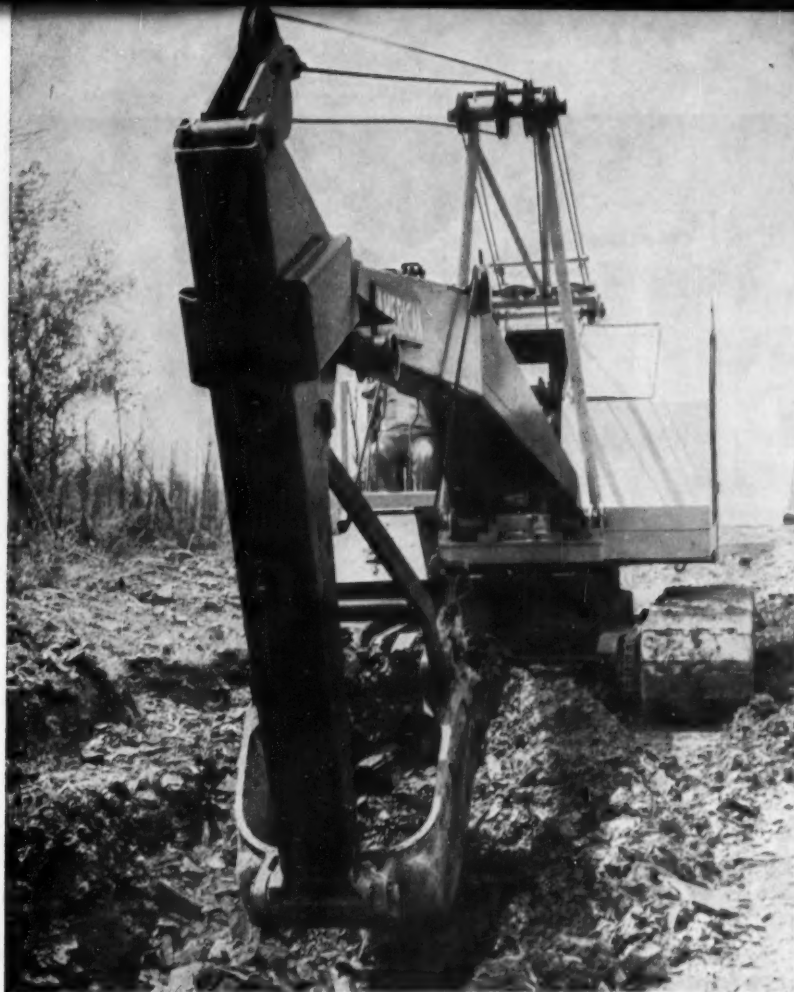
AMERICAN DIGS THROUGH HARD SHALE WITH "NO DOWNTIME"



"Our two American 300 Series Backhoes have been real producers even in the eight miles of hard shale encountered at the Little Rock Air Force Base Project," says Bruce Bird, Project Engineer for T. F. Scholes, Inc. "With American's dipper pitch bar arrangement, we adjust the dipper pitch for best results in any type soil," Bruce says. "This way, the operator gets faster digging action and makes more swing-dump cycles per hour without spillage—the kind of production you have to have to make money."

One of the country's leading contractors, T. F. Scholes, Inc., has found that American's rugged design, trouble-free travel assembly and fine engineering not only reduce maintenance costs, but result in dependable, low-cost production.

"**FASTEST PRODUCING BACKHOE** we've had on any job," says Project Engineer Bird. "The American's controls are right where they belong for fast, easy handling, and, with anti-friction bearings in the brake linkage, our operators turn out a big day's work without being tired."



RUGGED DESIGN of the American's boom and dipper stick is shown in a close-up at left. Of box-type construction, it has great strength with relatively light weight. The photo also shows clearly how the exclusive dipper pitch bar arrangement makes it possible to tuck the dipper up at an angle to keep the load from spilling. It's another of the advanced, time-saving engineering features that makes American the top-producing Crawler Crane in the field.



LOW OPERATING COST and high production records make the new American 100 Series Crane industry's top dollar buy in the $\frac{1}{2}$ -yard class. Shown with a shovel front, this versatile, highly-maneuverable crane can be quickly converted for clamshell work, as a lifting crane or backhoe. American's 78 years of experience making the world's biggest and most rugged lifting equipment is clearly evident in this new money-maker. Every pound, every inch of space, is utilized for top production. Everything is easy to get at for routine maintenance.

WORLD'S RECORDS fall regularly to products of American Hoist. Recently, in the Gulf of Mexico, a new American Derrick, specially designed for off shore oil operations, made a new world-record lift of 800-tons. The lift was nearly twice the previous estimated record made by the block and fall method. The same engineering experience—over three-quarters of a century—that makes such feats possible, is seen in American's extensive line of Crawler and Truck Cranes. Day after day, on jobs across the country, American Cranes are proving their superiority—giving outstanding performance at low operating cost. For factual details on American Crawler and Truck Cranes, contact your local American Distributor, or write American Hoist and Derrick Co., St. Paul 1, Minn.



SAFELY, SWIFTLY, EASILY, a 108-inch concrete pipe section weighing 16,650 pounds is lowered into place by an American 300 Series Truck Crane. The American's power-controlled boom lowering combined safety with speed and enabled the contractors to lower the 8-ton pipe sections with pinpoint accuracy.

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MATTER
WHAT
THE
WEATHER...**



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Everyone Loses

LAST SUMMER, a highway excavation in New York City caved in and killed six children who were playing there. Last month, five construction company officials concerned with the project were indicted by a special grand jury and charged with second degree manslaughter. They were accused of "gross and culpable negligence of duty." Maximum possible sentence if convicted: 15 years each.

But the results of this and other construction tragedies go far beyond those persons immediately involved. Not only do they affect the victims, their families, and the contractors on whose jobs the accidents occur; they affect the entire construction industry. The above cave-in is a case in point:

Influenced by this disaster and the ensuing public clamor, the State Department of Public Works has just announced changes in its highway contract proposals and specifications as applied to roadbuilding within city limits. They put squarely on the contractor the responsibility for safety of the public—"any person who for any reason enters the work area."

Other provisions call for watchmen at all times, proper signs and barricades, and written notification to local police of construction site conditions and subsequent changes made on them as the job progresses. Requirements for sheeting excavations are tightened considerably. And a drastic increase in minimum insurance requirements is called for. Bodily injury minimum coverage goes up from \$50,000/\$100,000 to \$500,000/\$1,000,000, while property damage takes a similar 1,000% jump.

It is no secret that construction accidents penalize everyone. Yet trying to prevent accidents and arranging for protective insurance is only one phase of the safety problem. Another is minimizing the effects of accidents after they occur.

Included in this phase are first-aid facilities to care for the injured workman. Such facilities should not be confined solely to large jobs, either. Even the small project should provide them when prompt medical care is not available locally.

An interesting cooperative operation along this line was set up recently by a group of seven individual prime contractors working at a North Dakota air base. The Corps of Engineers project was 18 mi from the nearest doctor. And no one job was large enough to have to comply with the Corps' mandatory requirement of a first-aid station and full-time attendant when a contractor's work force is 100 men or more per shift.

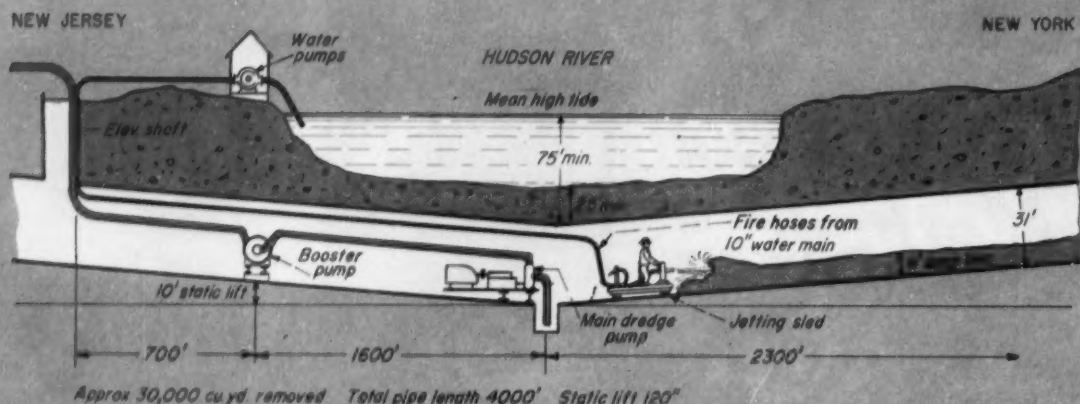
But even though there was no legal or contractual compulsion to set up job-site medical facilities, the construction companies banded together to do so on a non-profit basis. A 30-ft trailer was rented for a clinic and a station wagon for an ambulance. Under direction of a doctor who visited the job daily, a medical student and a qualified first-aid man provided on-the-spot care.

Cost for these facilities—prorated among all the contractors on a manhours worked basis—was about $\frac{3}{4}$ ¢ per manhour and ranged from \$42 to \$320 per month per company.

Was it worth it? Of course! Minor injuries treated on the job saved the time and expense of a 36-mi round trip to a doctor. Prompt medical attention kept injuries from becoming more serious. The physical facilities solidified the various companies' job safety programs. And the fact that the contractors were concerned about worker well-being improved job morale to the point where accident rates on the several projects were considerably below normal rates compiled by the Corps.

So, something can be done about construction safety. It had better be. Unless the industry polices itself and improves its accident prevention practices and medical facilities, governmental bodies will step in and do it. And that will be a sad day for all.

Want to learn more about safety? Visit the Construction Sessions, National Safety Congress, Conrad Hilton Hotel, Chicago, October 22 and 23.



TWO OUTSIDE PUMPS supply 4,600 gpm to fire hoses on the jetting sled. The hoses break down the silt bank into a slurry that flows by gravity to a sump. Two dredge pumps, one a booster pump, deliver the slurry 4,200 ft to the point of discharge.

Hoses, Pumps Move Tunnel Silt



THREE FIRE HOSES on the front of the jetting sled play into the silt bank while two hoses in the rear wash down the tunnel sides and keep the slurry moving toward the sump.

FIRE HOSES AND PUMPS did a fast, efficient job of removing 30,000 cu yd of silt from the mile-long third tube of the Lincoln Tunnel under the Hudson River between New York City and New Jersey.

The fine, tightly compacted silt had been allowed to accumulate within the cast iron tunnel rings to provide ballast. Depth of the silt ranged from 8 ft to 14 ft. Mucking it out with conventional equipment would have been a tedious, costly job.

Mason, Johnson, MacLean, the joint venture tunnel contractor, worked out the hydraulic method of removing the silt with help from J. N. Pearse, a representative of Morris Machine Works, supplier of the pumps.

They set the job up with four pumps—two in a shelter near the river bank to pump water into the tunnel and two dredge pumps in the tunnel to pump out slurry.

The two outside pumps—a Morris 8M double suction delivering 2,500 gpm at 240-ft head and a Morris 10x12 SA capable of 2,500 gpm at 50-ft head—supplied 4,600 gpm to fire hoses with 100 lb nozzle pressure operating from a jetting sled whose outer edges rested on the tunnel rings.

On the jetting sled, two or three hoses jet-sprayed into the bank of silt ahead while one or two others, operating from the rear of the sled, sprayed down the sides of the tunnel and helped keep the slurry flowing toward a sump.

As the silt bank in front of the sled broke up, an air hoist pulled the sled forward at intervals to maintain a proper distance between the sled and the face of the silt bank. Hoses on the sled were tapped into new connections on a high-pressure water line when the sled had advanced the maximum hose length.

Pumping the Slurry

The slurry moved by gravity flow to a sump in the middle of the tunnel. The sump was a caisson 10 ft in dia sunk 20 ft into the tunnel floor with trash racks to keep debris from the suction end of a pump mounted 8 ft above the top of the sump.

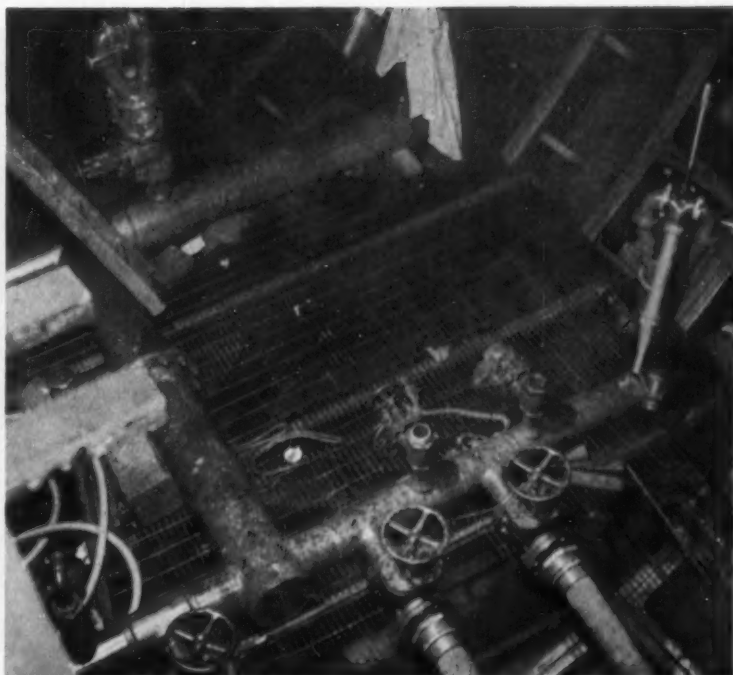
Gravity flow of the slurry was even better than expected. Near the middle of the tunnel, pitch is only 0.8 ft per 100 ft; in other sections it increases to nearly 5 ft per 100 ft. But even where pitch is lowest there was no serious settling out of silt. Small islands of silt formed temporarily in some low spots, but they were washed away later with no difficulty.

The sump pump was a Morris 10 GA 28½-in. dredge model powered by a variable speed motor with 300 hp at 880 rpm. It fed slurry to an identical booster pump 1,600 ft nearer the end of the tunnel. These two pumps delivered the slurry 4,200 ft to the point of discharge. Vertical head was 118 ft (8 ft lift from sump to pump and 110 ft from pump to discharge point).

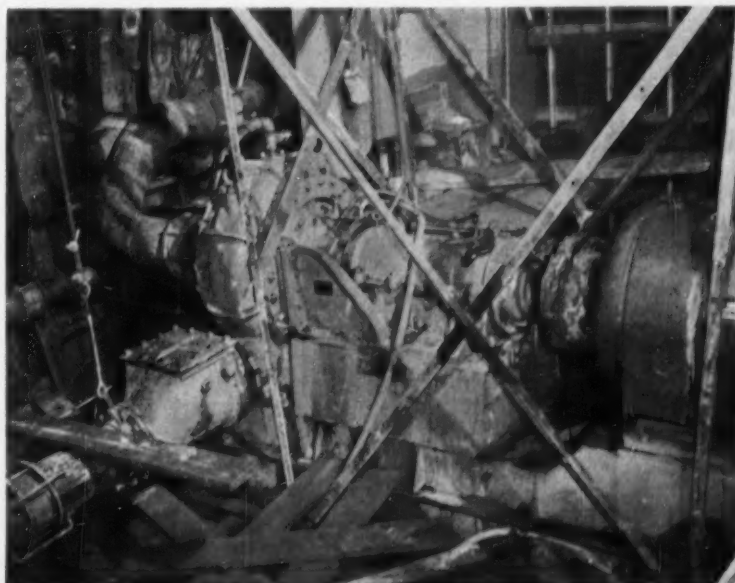
Communications

Because of the distances involved, a complete telephone system was set up from the jetting sled to the pumping stations. Normally, the operator at the river pumps notified the jetting sled when he was starting the pumps; the jetting sled alerted the operator at the sump pump when slurry began to drain back toward the middle of the tunnel; and the operator of the sump pump warned the booster pump when he was ready to start pumping.

With three shifts working around the clock, removal of the silt re-



JETTING SLED sits near bottom of the tunnel, its outer edges resting on the tunnel rings. An air hoist pulls the sled forward at intervals to keep it close to silt bank.

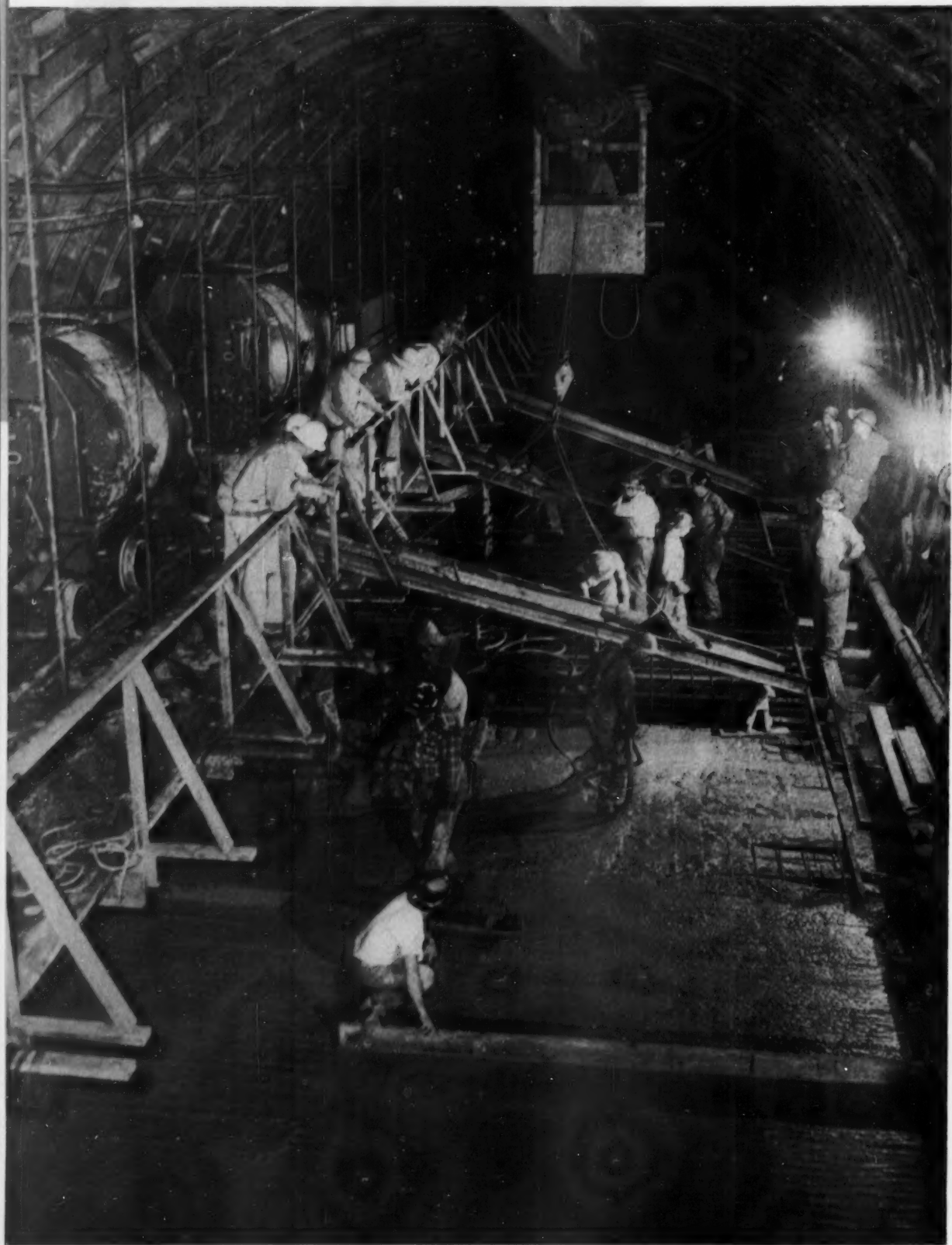


BOOSTER PUMP is located 1,600 ft from the sump pump and about 2,600 ft from the point of discharge. Its intake line is at the upper left; discharge line, lower left.

quired just 20 days of pumping. The jetting sled began at the middle of the tunnel and worked toward the New York side at a rate of about 150 ft per 8-hr shift. When that half of the tunnel was finished, it shifted to the New Jersey half. Sandhogs handled the jetting sled, and an electrician and

an operator were stationed at each of the pumping stations.

When all silt had been removed, the tunnel rings were air blasted with aluminum oxide to remove rust, cracks between the plates were calked with lead, and the floor was swept clean for concreting.



ROADWAY CONCRETE is 15 in. thick and heavily reinforced. Agitator cars feed into chutes that are moved forward by a hoist riding a rail mounted at the crown of the tunnel.

Special Forms Speed Concreting

CONCRETING the tunnel is a complex operation that requires top notch coordination by the contractor. At the peak of the operation, Mason-Johnson-MacLean will be juggling concrete to nine sets of forms and completing interior construction of the tunnel at the rate of 64 ft a day.

Ready-mix trucks deliver concrete to the head of a 55-ft shaft on the New Jersey side of the tunnel and unload it into supply hoppers. Agitator cars carry the concrete to the point of placement.

But it is the use of traveling and telescopic forms that makes possible a continuous concreting operation. The forms were designed and built by Blaw-Knox. All forms, except the ceiling form, are 128 ft long. When all are in place for continuous pours, the lead form will be 2,500 ft ahead of the rear form. Each form is poured on alternate days.

First pour is the 16-in. thick invert which then supports the road-way form. Roadbed concrete is 15 in. thick and heavily reinforced with both I-beams and reinforcing rods. The 4½-in. pavement brings total roadbed thickness to 19½ in.

When roadbed concrete has cured sufficiently, supply car tracks and form tracks are laid, gutter and curb are poured in quick succession, and the previously assembled sidewall form is moved into place and adjusted by means of steamboat ratchet jacks which act as mounts for the face of the form.

While concrete is pumped behind the lower sidewall form, workmen use the top of the form frame as a scaffold to install upper sidewalk reinforcing conduits, etc.

On the day after the pour, workmen remove the lower form with ratchet jacks and move it ahead for the next pour. Then the upper sidewall form is moved into place, and concrete poured. The top of the upper form serves as a scaffold for preparation of the arch.

Forming for the arch is similar to that for the lower and upper sidewalls. Concreting, however, is different. The contour of the arch form leaves only 2-in. clearance between the form and the flanges of the upper tunnel rings so it is necessary to pump concrete through 8-in. pipes set on 5-ft 4-in. centers

in rows 10 ft apart on the underside of the form.

Forming and pouring the ceiling slab is one of the most unusual parts of the job. The ceiling form is 384 ft long. It is telescopic and designed so that the rear section can be collapsed quickly, moved through the sections ahead, and repositioned. In addition to the advantage of continuity of work, this simplifies coordination of setting the ceiling tiles.

A total of more than 400,000 4½x4¼-in. ceramic tiles will line

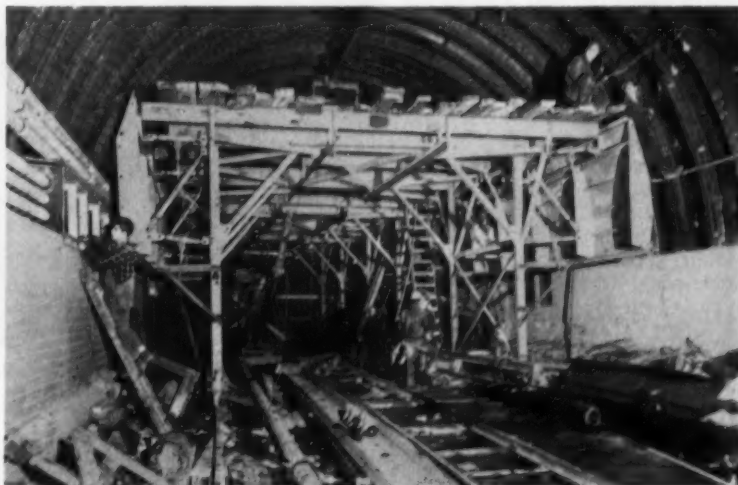
the tunnel. The one-third of them that go into the ceiling are put in place before the ceiling slab is poured.

Here's how it's done. The ceiling form is set to grade and covered with heavy paper. Then an adhesive is applied to the upper face of the paper, and the tiles are laid face down in the glue. When a form section is tiled, reinforcing, conduits etc., are placed and concrete is poured on top of the tiles.

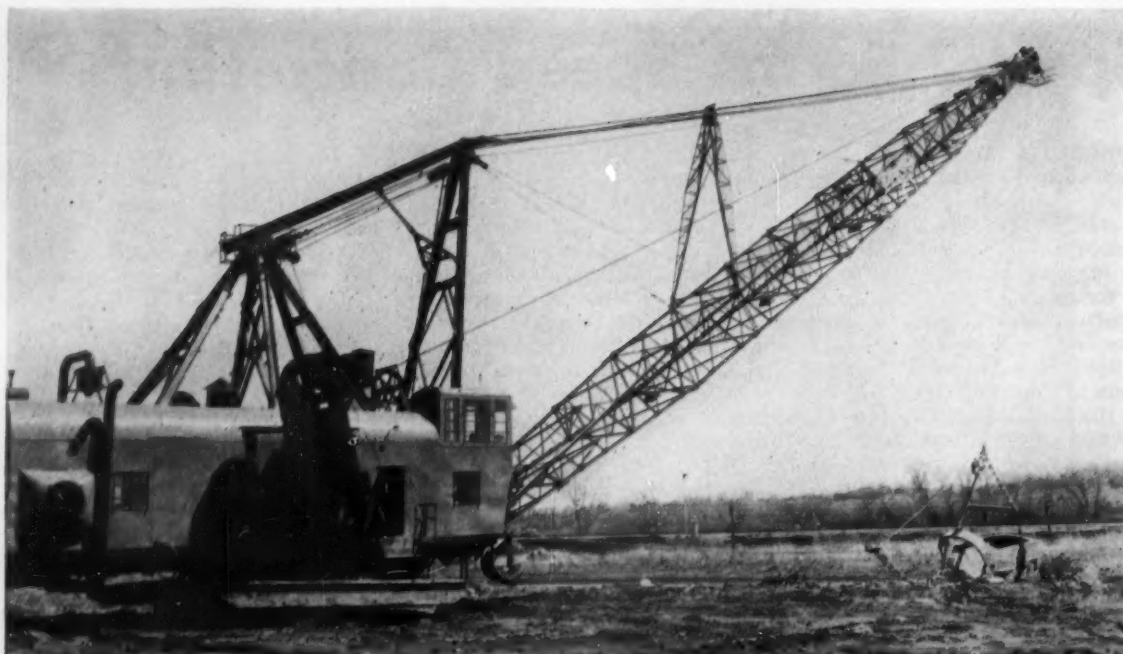
Sidewalk forms follow, and the walls are tiled behind them.



LOWER SIDEWALL FORM is adjustable every 10 ft by sets of three steamboat ratchet jacks that act as mounts for the face of the form. Jacks also simplify stripping the form.



UPPER SIDEWALL FORM goes into place after lower form is stripped. Top of the upper form serves as a scaffold for installation of reinforcing, conduits etc. for the arch.



REAL WORKHORSE on canal widening job is this huge new Page 723 diesel-powered walking dragline. Assembled on the job, the rig uses 140 ft of boom and a Page 9 1/2-yd bucket to pull overburden off bedrock and later to remove blasted rock.

Draglines, Drills Widen Canal

IF YOU EVER have to widen a barge canal from 60 to 225 ft through limestone, better figure a way to step up your blasting operations.

That's what Mary Construction Co. of Cape Girardeau, Mo., had to do to come out in the black cost-wise on its \$1.8 million contract to widen the first 3 mi of the 16-mi-long Calumet-Sag Canal near Chicago.

Mary expected problems when it signed the contract for the job. Channel traffic could not be interrupted during the work. Mary's plan was to leave one wall of the channel standing, collapse the opposite side where the widening would be done, and let the water flow in as excavation proceeded. The channel walls were concrete, about 24 ft deep and 2 to 3 ft thick.

Excavating Overburden

Limestone lies chiefly just below the water line. Covering the stone to about 5 ft above the water line is glacial till, peat, clay, and silt. Mary mounted two draglines along the channel bank to remove the overburden. They pull out material

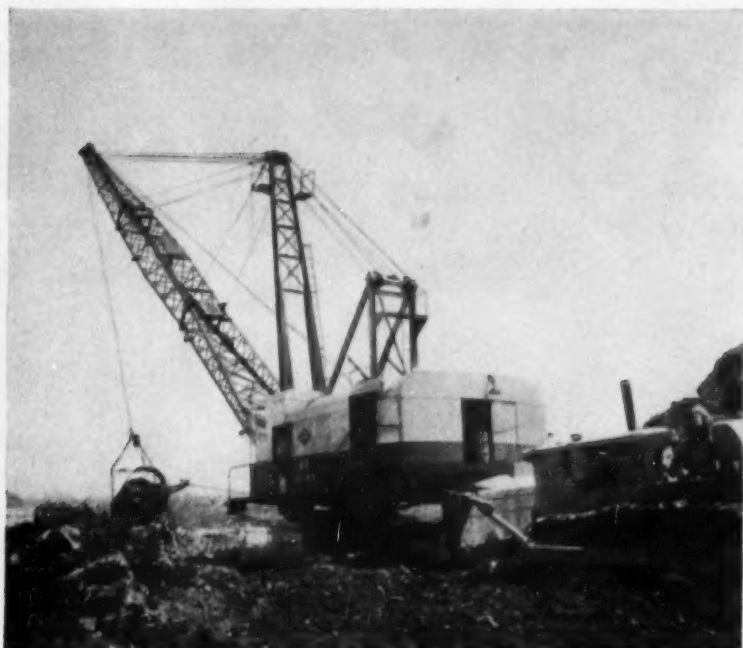


THIS WAS THE PROBLEM—How to widen this 60-ft canal outside Chicago to 225 ft without interrupting flow of canal traffic. Strata of limestone under overburden slowed job.

and deposit it in a permanent spoil bank parallel to the channel's designed new bank.

The spoil bank will have a 70-ft

base, a 63-ft height, and 30-ft crown. Draglines are a Lima 2400 fitted with 120-ft of boom and a 7-yd bucket and a new Page 723



ANOTHER POWERHOUSE is this Lima 2400 fitted with 120-ft boom and 7-yd bucket. D9 dozer picks up spillage and carves out temporary roads in work area for utility trucks.



DRILL, with Gardner-Denver compressor on D7, is a Joy Challenger.

diesel-powered walking dragline fitted with 140 ft of boom and a 9½-yd bucket.

A Caterpillar D9 bulldozer supplements the draglines by picking up spillage. The D9 also carves out temporary roads along the work area.

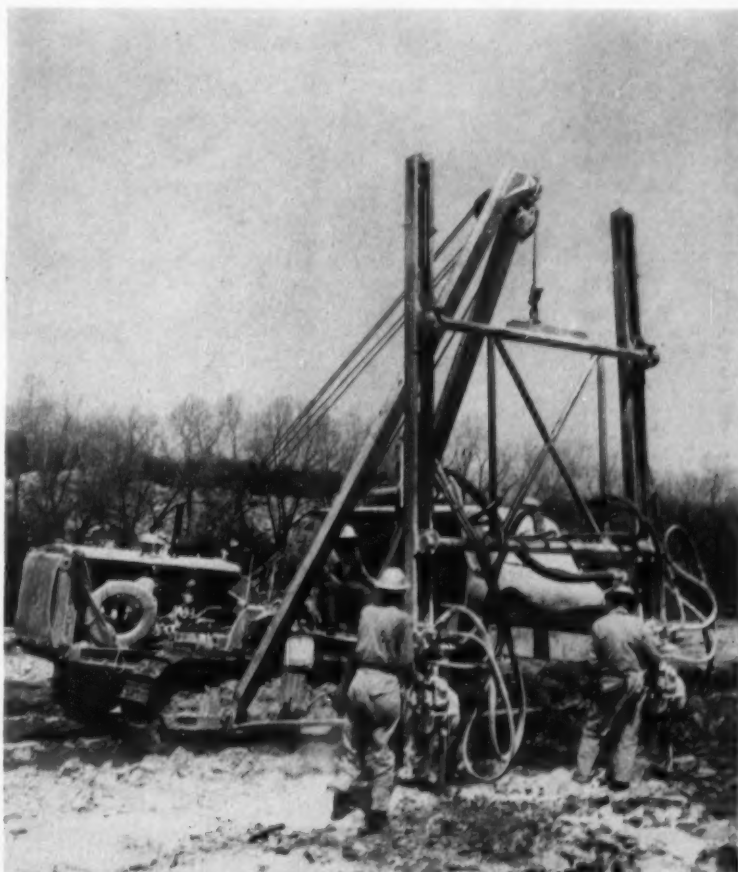
Once material above the limestone has been removed and deposited on the spoil bank, the tough problem of economically removing the limestone begins.

Removing Bedrock

The contractor's blasting plan is to open up 90x135-ft areas of finely fragmentized rock per shot. This makes it easier for the draglines to remove the rock after canal water has flowed into the blast area.

To carry out this plan, Irwin Garms, project manager, drills a 200-hole pattern of 3½ and 4½ in. dia blast holes parallel to the canal and 24 ft deep. To increase his drilling speed, Garms mounts drills and compressors on two tractors to get unhampered, full efficiency drilling along the canal bank.

A single Joy 4½-in. dia Challenger drill is mounted on the front end of a Caterpillar D7. Handling 24-ft steel, this rig works a 12x14-ft pattern. A Gardner-Denver 600-



MOUNTING two Gardner-Denver DH123 drills by side boom on a Cat D8 tractor helps speed drilling operations. Ingersoll-Rand 900 Gyroflow compressor is mounted on rear.



BARGE DRILLS came into the picture when bedrock took a sudden dip below water level. Contractor took drills from tractors and mounted them on barge. Barge moves in to drill blast holes after overburden first is removed by the two draglines.

cfm compressor mounted on the tractor rear supplies the air.

On a Cat D8 Garms mounts two Gardner-Denver DH-123 drills with 3½-in. dia bits on a side boom. These work an 8x11-ft pattern. Power for the drills is supplied by an Ingersoll-Rand 900 Gyro-Flo compressor. Two 12-ft drill rods, connected by male and female threads, enable Garms to reach the full 24-ft hole depth.

Blasting

Working parallel to the canal banks, the tractor-mounted drills prepare an area for a shot every three days. For the blast, the 200 holes are packed with 10,000 lb of Atlas 40% gelatin. This is detonated by Atlas Rockmaster milli-second delays, 0 through 10, primed in the bottom of the hole. The powder, loaded to an overdepth of 5 ft, pulls 15 to 20 ft of rock per shot, or about 13,400 tons of material.

Draglines move in immediately after each shot as canal water flows in around the blasted rock. Using perforated buckets they drag shoreward from the water until the 90-ft width of the blast area is excavated to proper grade. Fractured rock goes into the spoil bank.

Normally, a single handling of the rock is all that is necessary. In certain areas—where the spoil

bank is distant—one or two re-handlings are required.

Extra Problem

An unexpected snag came up midway through the job. The level of the limestone in some areas takes a dip to as much as 22 ft below the water line. This makes it impossible to dragline out overburden and blast the exposed rock. Attempting to drill to rock through the overburden also is out of the question. Holes would be impossible to case or load.

"So we remove the overburden by dragline and rely on drill barges to drill through the rock in water," said Garms.

In these areas, the contractor removes the DH123 drills from the D8 and mounts them, along with a third DH123, on a drill barge. Drills operate with extended mast to handle 24-ft steels and avoid steel changes. Using 3½-in. dia bits, Garms drills a 10x10-ft pattern. Two ME6 Murphy engines and two WJ3 Sullivan air compressors power the drills.

Water Blasting

Atlas 40% Giant gelatin in 3 and 4-in. dia cartridges is loaded through pipes into the holes below water level. Detonation is entirely by Primacord. The draglines remove the fractured rock.

Final Touches

Once the 3 mi under Mary's contract has been widened to the full 225 ft, the contractor will trim the limestone on the new bank and construct a rip rap wall extending up above the water line. Previously excavated limestone will be used for the rip rap.

The spoil bank rests on 12-ft-deep keys cut into the rock. Last stage of Mary's work will be to completely dress the bank with top soil and grass.

The Cal-Sag Channel widening was authorized by Congress in 1946 as an adjunct to the St. Lawrence Seaway Project. Its purpose is to increase channel traffic capacity by four times.

The excavation phase alone will cost \$36 million. Other work includes \$61 million in railroad and highway bridges over the new channel and construction of a \$5 million lock in the Calumet River. Total construction time is expected to run 6 yr.

Three to five more contracts will be let by the U. S. Corps of Engineers for the remaining 12 mi of work.

Job superintendent for Mary is William H. Jordan. The Corps of Engineers project comes under the jurisdiction of Col. Philip F. Dromer, Jr., district engineer in Chicago.



MOBILE BATCH PLANT mixes cement and aggregates dry and drops batch onto conveyor belt that feeds mix into standard highway paver. Concrete then is lifted by bucket and dumped into a 25-yd hopper that loads it into waiting Dumperete trucks.

Recipe For a Low-Cost Concrete Plant

- Take one mobile batch plant
- And a standard highway paver
- Connect with a conveyor belt
- Add a touch of contractor ingenuity . . .

. . . AND you can put together an inexpensive, portable concrete batch plant capable of producing 700 yd of ready-to-place concrete a day.

C. F. Replogle Co. of Circleville, Ohio, recently landed a \$1.8 million contract to build 3 mi of four-lane highway on the outskirts of Middletown. Space was tight and the job was relatively small. Replogle reasoned that the most economical way to pave would be to truck in ready-mixed concrete from an off-the-job site instead of trying to crowd pavers and batch trucks into the restricted working area.

The contractor often uses ready-mixed concrete in his work and owns a fleet of 16 trucks with Dumperete bodies. He likes them because they get to the job fast, dump fast, and get off the job fast. But using Dumperete meant setting up a concrete plant near the job.

"We weren't about to spend a small fortune building a full scale plant for such a small job," said D. E. Goodchild, the job's project manager, and Replogle's vice president.

Replogle needed a low-cost plant capable of turning out at least the equivalent of what a dual-drum paver could in an 8-hr day. Replogle saw a way out in a mobile batch he owned, a Noble Mobile capable of producing about 700 yd of dry mix a day.

Take one batch plant . . .

Why not work the batch plant, Replogle thought, with a highway paver set up to discharge concrete directly into the Dumperete trucks? The effort paid off in more than a low-cost plant. Dumperete actually enabled the contractor to increase his pour rate by 10 yd an hr over on-job paver methods. This increase came from not having to roll heavy aggregate trucks to on-job pavers thereby causing traffic snarls. Snarls come from trucks taking up valuable room on the

paving strip while waiting to be unloaded.

Nucleus of the concrete plant is the Noble Mobile. This is a wheeled plant developed several years ago to batch concrete for jobs located too far from a central plant for economical handling (CM&E, Dec. 1954, P. 106).

The basic semi-trailer section of the plant consists of a 250-bbl cement bin and a three-compartment aggregate bin. Bulk cement is fed in over the back of the trailer by an enclosed elevator. A scale and electrical control panel are set up on one side and operated from a platform which folds down in front of the trailer when not in use.

Eight jack-legs attached to the plant's underside hold it rigid in normal use. Replogle, however, wanted to move dry mix to the paver by conveyor. Placing the plant up on 6-ft legs permitted him to get the conveyor belt beneath the plant's discharge hopper.

An inexpensive foundation and steel columns solved this problem.

Continued on next page

LOW-COST CONCRETE PLANT . . . continued

Workmen poured eight (one for each jack) 5x5-ft footings 16-in. deep. Eight 6-ft sections of 12-in. H-beam columns were placed vertically over the footings and capped with lengths of steel beam.

The plant then was partially dismantled and lifted in sections onto the supporting columns where it was reassembled. The contractor used a Lima 604 crane with 70-ft boom (kept to charge the plant hoppers) for the lifting.

Because the plant would be going steadily day in and day out, the contractor needed to increase the plant's normal storage of 250 bbl of cement and 28-ton aggregate hopper. To do this, Replogle erected alongside the plant two 700-bbl Heltzel cement silos and elevators. When batch plant cement is depleted, silo cement is raised by elevator and discharged from the top of the silo through a 12-in. pipe.

The contractor also fabricated an addition to the plant's hopper capable of holding 190 tons of aggregates. Aggregate as well as cement comes to the job by truck and is stockpiled alongside the plant. The crane—using a clamshell bucket—feeds aggregate into the plant's three-compartment hopper.

Batches are manufactured at a rate of one every 12 sec. This speed is due to the mobile plant's system of triple batching—a feature normally found only in larger airport and highway plants. The plant has three scales. Coarse and fine aggregates are weighed at the same time as the cement. After aggregates are weighed, and while cement still is being weighed, hopper gates automatically are opened and the sand is weighed.

The dry batch then is discharged on to a 70-ft Austin-Western conveyor belt at a maximum rate of one batch every 12 sec.

Add a standard paver . . .

The lower end of the belt is set under the plant's discharge chute, and the upper end feeds a Blaw-Knox 34-E dual-drum paver set on a 15-ft-high mound of dirt. The



CEMENT SILOS (left) supplement 250-bbl cement storage bin of Noble Mobile. Cement is carried by elevator to silo top where it goes through 12-in. pipe to refill batch bin.



REMOVING SKIP from Blaw-Knox 1-1/3-yd paver and substituting Insley concrete bucket as a funnel permits feeding dry batch directly into the rig's drum by the conveyor belt.

mix is fed into the drum through an Insley concrete bucket set on the skip mount. The conveyor belt is supported at about a 20-deg angle by an adjustable A-frame.

Once mixed in the paver, the concrete is carried by bucket up the paver's high-lift boom and dumped into a raised 25-yd hopper built by the contractor. Concrete is discharged from the hopper in 4- to 6-yd loads into Dumperete trucks. Two-way radio keeps the plant informed of job needs.

Add a touch of ingenuity . . .

Hopper discharge gates are actuated by air-rams secured against

the hopper legs. Rams are controlled by electric solenoids on the paver. Rams are worked from the paver. The operator on the paver—high above the trucks—can readily see when trucks are loaded. A Worthington 125-cfm Blue Brute compressor supplies air for the rams.

Once loaded, the trucks make a quick 5-min. run to the job, discharge their loads in front of the machines on the paving spread, and return. A round trip takes about 12 min.

The paving operation itself is typical. Lanes on the highway are 12 ft wide. Specifications call for 6



BUCKET DUMPS concrete into raised hopper where it is stored until ready to be discharged into waiting Maxon Dumpcrete truck.



CONCRETE is dumped from trucks directly into 12-ft-wide paving strip in front of paving machines. Round trip for trucks is 12 min.



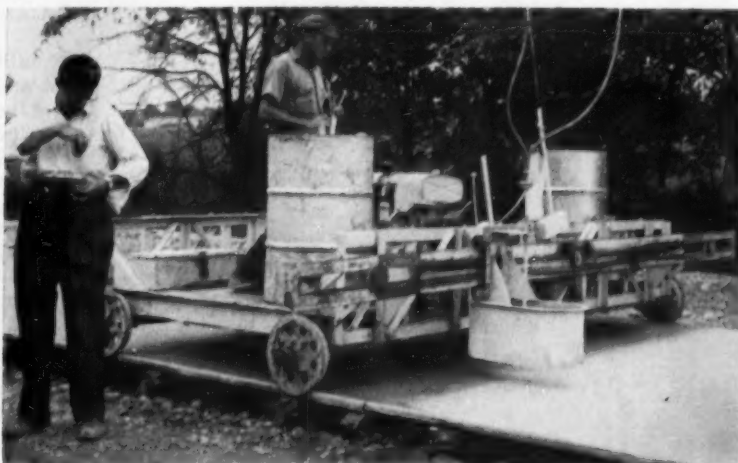
FIRST LAYER of concrete for slab is struck off at 7-in thickness by Jaeger spreader. Mesh and 2-in. concrete are added and spread.



ROUGH FINISH is given slab by Heltzel Flex-Plane finisher which follows along after spreader. This strikes slab off clean at grade.



LONGITUDINAL FLOAT, a Koehring, follows finishing machine. Workmen hand-cut joints, and slab is scored with burlap drag.



FINISHING TOUCH comes with spray of Permite curing compound which is placed by this Flexible Road Joint curing machine. Slab cures for several days before forms are stripped.

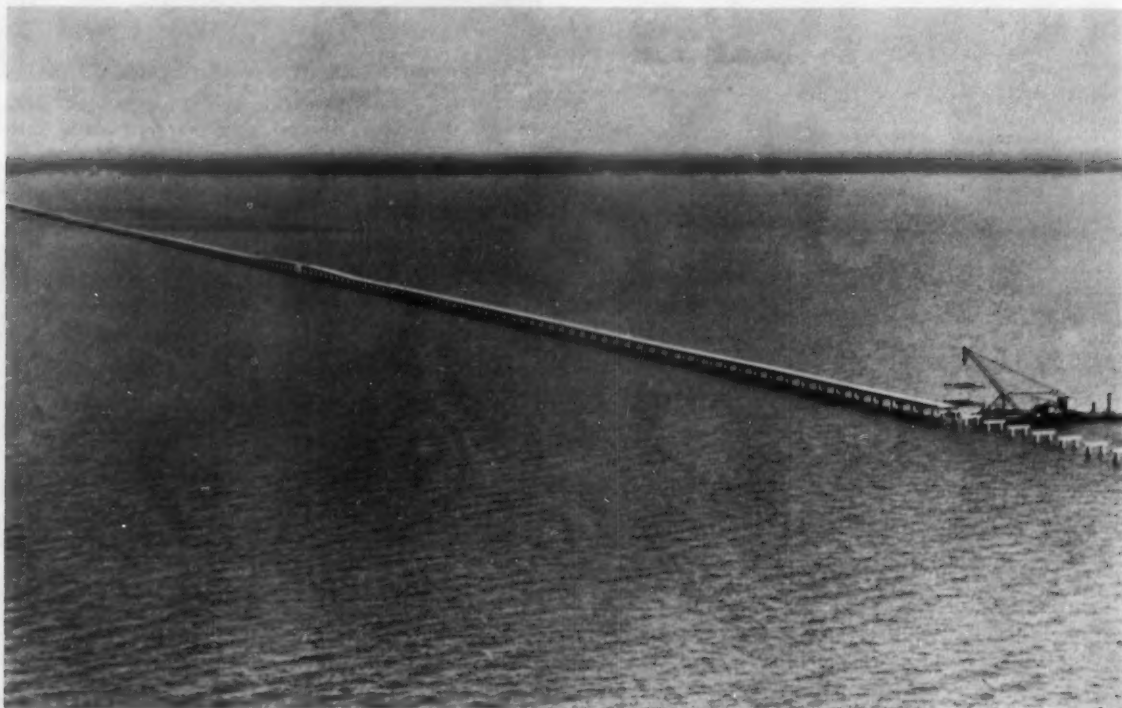
in. of crushed stone sub base followed by 9 in. of concrete reinforced with welded wire mesh.

A Jaeger spreader first levels the concrete off at 7-in. depth. Workmen then place sheets of 6x12-0/4 wire mesh after which an additional 2 in. of concrete is placed and graded by a second spreader.

A Heltzel Flex-Plane finishing machine gives the slab its initial strike-off, and a Koehring longitudinal float follows up with a finer finish. After workmen hand cut joints, two men lay down a blanket of burlap across the slab to score it. Final touch before forms are stripped is spraying a controlled dose of Permite curing compound over the slab with a Flexible Road Joint curing machine.

EDITOR'S NOTE

Another article, describing the erection of precast units into the causeway, will appear in November.



World's Longest Highway Bridge — A Mass-Produced Marvel

BUILDING a precast bridge across 24 mi of storm-swept water is a gigantic feat in itself. But completing it a full four months ahead of the 23-month schedule is nothing less than sensational.

Yet, just 15 months after the first pile hit water, toll gates swung open on Louisiana's Lake Pontchartrain Causeway.

The job was a masterpiece of mass production. Scoring new highs in assembly-line precasting and prestressing, Louisiana Bridge Co. turned out thousands of top-quality concrete piles, pile caps, and deck slabs. And with equal adeptness, they barged the massive units across the wide lake and pieced them together at a fast pace.

Today, the Greater New Orleans Expressway Commission is proud owner of one of the world's foremost structures. It is beautiful,

modern, safe, easy to maintain—and it cost only \$6.50 psf to build.

Pace of the project was governed by the output of the job-site precasting plant. Working two 10-hr shifts a day, it produced forty-eight 200-ton prestressed deck slabs, and 48 pile caps every six-day week. Pile-making crews were under less pressure. They worked only one 10-hr shift per day and turned out about 90 piles per six-day week.

The job required 4,886 prestressed cylindrical piles, 2,240 caps, and 2,232 prestressed monolithic deck slabs. Except for aluminum handrail, virtually everything was precast.

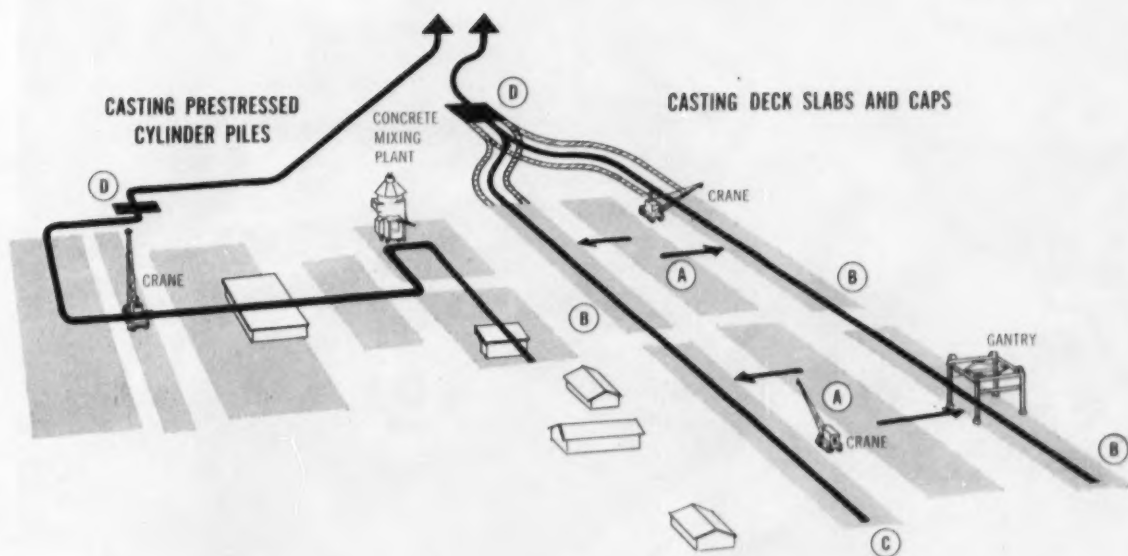
The job got underway about Feb 1 of last year when a \$30 million contract was awarded to Louisiana Bridge Co., a joint venture of Brown & Root, Inc., Houston, and T. L. James & Co., Ruston, La.

The contractor quickly moved into a 40-acre site at the edge of the lake's north shore, a short distance from the bridge terminus.

In only four months, they built a \$6 million precasting plant and dredged an entrance canal from the lake 12 ft deep, 150 ft wide, and 1,200 ft long. The 200,000 yd of shell dredged from the canal was placed over swampy areas to raise the level of the site. To support the many plant structures, they drove some 7,500 wood piles and poured 30,000 yd of foundation concrete.

The plant was divided into two primary areas—one for caps and slabs, the other for piles. Between the two areas, a Johnson semi-automatic plant batched and mixed concrete.

All concrete materials were brought in on barges. A clamshell



PRECASTING PLANT covers 40 acres on north shore of lake. Slabs and caps are cast on right side and piles on left. Details of pile area are shown on next page. In slab area, reinforcing mats are prefabricated at A

and placed in steel forms on any one of three casting beds. B. Caps are cast in fourth bed, C. Gantry hauls slabs and caps to dock and loads on barges, D, for transporting to lake. Whirler carries piles to second dock, D.



How Bridge's Prestressed Piles Are Made



CYLINDER PILES are made at huge plant by joining and prestressing 16-ft precast sections. Overhead cranes handle steel forms. Numbered arrows show sequence of pile manufacture and correspondingly numbered photos show these operations in detail.

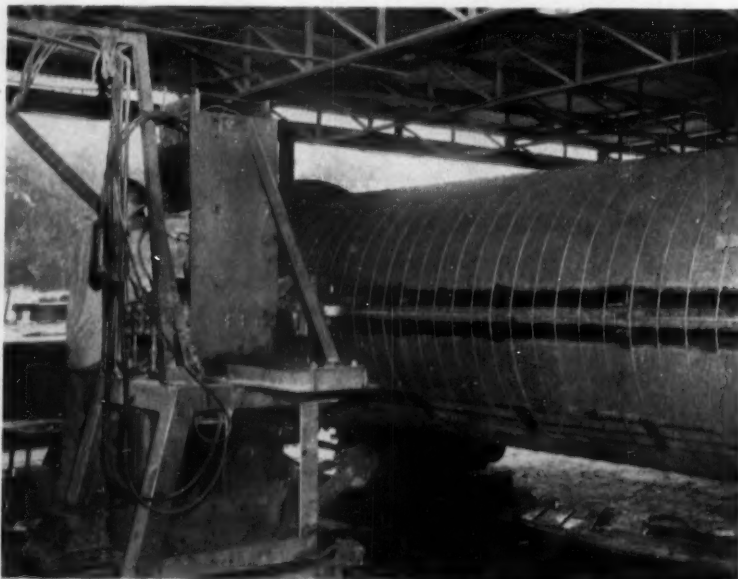
PONTCHARTRAIN BRIDGE . . . continued

unloaded them and built up stockpiles over a reclaiming tunnel that fed the plant by conveyors. Cement was pumped directly from 5,000-bbl barges to a bin at the top of the plant. Batches were mixed in three Koehring 3-yd tilting mixers, dumped into buckets, and hauled to either slab or cap forms. To make 8,000-psi concrete for piles, zero slump concrete was mixed in either of two 2-yd Besser paddle-type mixers mounted on one side of the batch plant.

Casting Piles

Piles were hollow, cylindrical units 54 in. in dia with 4-in. wall thickness. Average length was 88 ft. The contractor manufactured them under a license agreement with the pile's designer, Raymond Concrete Pile Co., and Cen-Vi-Ro Pile Corp.

(Continued on page 64)



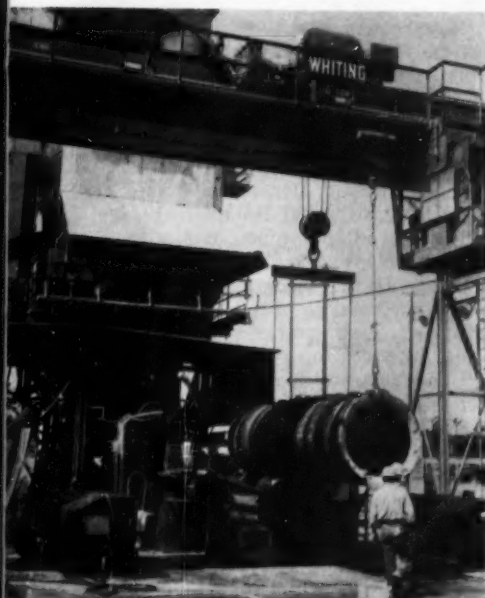
1 REINFORCING SPIRAL is wound around hydraulically operated mandrel. Spaced 5 in. apart, 1/4-in. wires are tack welded automatically to 3/8-in. longitudinals.



2 MANDREL of steel rods covered with rubber hoses is lowered into spiral.



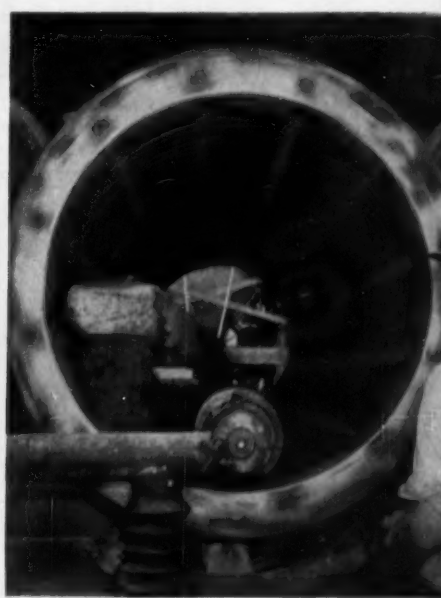
3 STEEL FORMS set on hand cars wait for spinning. High-strength concrete for piles is mixed in Besser paddle-type units mounted on side of batch plant.



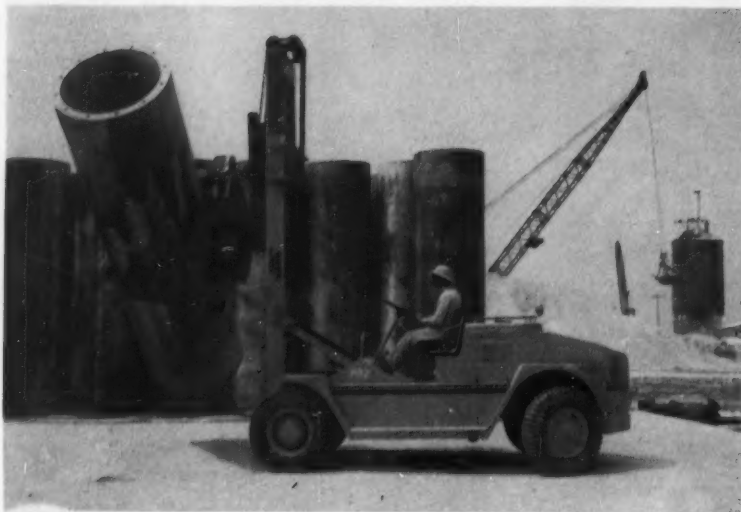
4 OVERHEAD CRANE turns form horizontal, sets it on spinning trunnions.



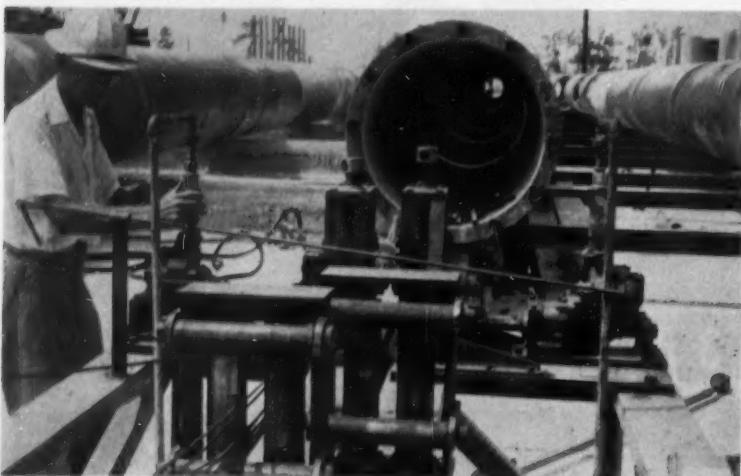
OPERATOR with push-button panel controls spinning. Form spins up to 350 rpm.



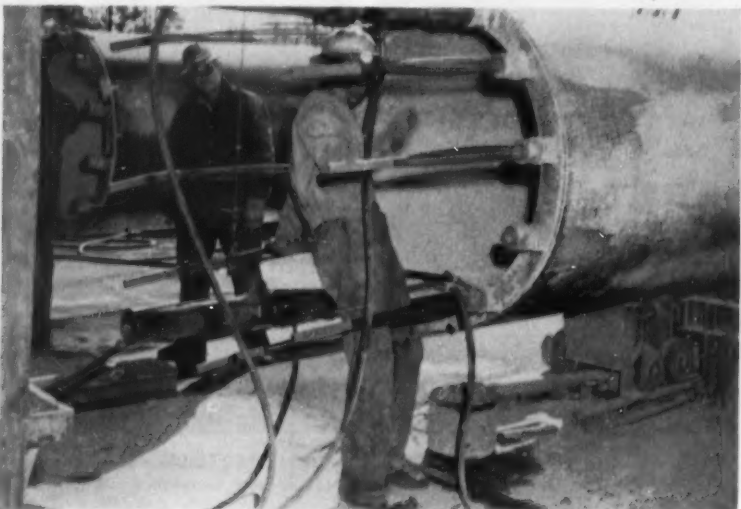
CANTILEVERED FEEDER distributes concrete inside as roller compacts.



5 PILE SECTION 16 ft long and covered with curing compound is hauled to storage area by Clark-Ross truck with revolving gripper. In 2 weeks, units are prestressed.



6 AIR WRENCHES feed groups of 12 wires into ducts (above). Two jacks (below) stress two groups at once. Piles rotate and also move longitudinally on dollies.



PONTCHARTRAIN BRIDGE... continued

Piles were made by joining precast concrete sections, mostly 16 ft long, and post-tensioning them. Some 8-ft lengths also were produced to provide flexibility in pile length.

The pile making process started at a spiral reinforcing machine. It wound a $\frac{1}{4}$ -in. wire around a hydraulically operated mandrel, spacing the wires 5 in. apart. To tie the spiral together, a second machine rode a track parallel to the mandrel and automatically tack welded the wires to $\frac{3}{8}$ -in. longitudinals.

The completed spiral cage was pulled from the mandrel and up-ended. One of three Whiting 10-ton overhead cranes then placed a second type of mandrel inside the spiral. Its purpose was to form twelve $1\frac{3}{8}$ -in. longitudinal ducts for receiving prestressing wires. The mandrel consisted of $\frac{7}{8}$ -in. steel rods bolted into one end ring and wedged into another end ring for easy stripping. Rods were covered with $1\frac{3}{8}$ -in. dia rubber hose.

Mandrel and cage were lowered together into a special steel form set vertically on a hand car on a narrow gage track. The form was pushed to an adjacent area where it waited in line for its turn to be concreted by spinning.

One after the other, forms were picked up by an overhead crane and moved to one of two spinning units. Enroute, the form was turned to a horizontal position by a small electric hoist mounted under the crane. Carefully, the crane moved the form over one of the spinning units and lowered it on to rubber-tire trunnions.

Spinning

The spinning operation was similar to the Cen-Vi-Ro method of making concrete pipe. Basically, it is a process of centrifugally spinning a dry mix, vibrating at proper frequency and amplitude, and rolling with great pressure. It is fast and produces top-quality sections.

The form first was rotated slowly while a cantilevered feeder ran back and forth inside the form distributing concrete. The feeder was supplied by a rail-riding hopper that was charged with concrete under the two Besser mixers. The hopper moved back and forth with the feeder. While the form filled with concrete, it was vibrated underneath. A longitudinal roller compacted the mix inside.

Continued on page 66

New CAT* No. 9 Ripper

FOR THE

Mighty D9!

First choice for push-loading, the D9 is now more versatile than ever. The new No. 9 Ripper lets the D9 rip tough or frozen material between loading cycles. Faster, easier scraper-loading cuts time and costs.



TRACTOR-MOUNTED

The tractor-mounted No. 9 Ripper utilizes the weight of the D9 to force the teeth into hard material. No need for ballast or extra weights. The hydraulically operated ripper affords maximum maneuverability because it is tractor-mounted.

"LIVE DRIVE" HYDRAULIC PUMP

New No. 50 Hydraulic Control has a constant power pump that supplies the capacity to raise or lower ripper teeth *independently* of flywheel clutch or torque converter.

TWO RIPPING POSITIONS

Shanks may be pinned in either of two ripper positions which provide either maximum ground clearance when raised or maximum penetration (up to 28") when lowered.

TRIPLE TEETH

Use one, two or three. Any or all of them can be swung up and pinned out of the way. Teeth pivot 10° to either side. This permits tractor steering and smoother ripping through rocks. Shanks are heat-treated alloy steel, with hardened alloy cast steel boots. Points are hardened cast steel, *pin-attached* for easy replacement.

MANY OTHER IMPORTANT FEATURES!

Now the new No. 9 Ripper makes the "King of the Crawlers" an even more profitable and versatile machine. Mail the coupon for full details, or call your nearby Caterpillar Dealer. And remember, you can count on him for reliable service, and for parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**MODERN HEAVY-DUTY
TRACTOR RIPPERS**

MAIL TODAY!

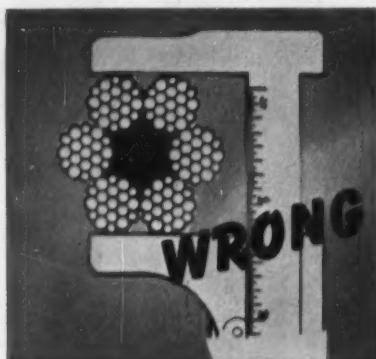
Caterpillar Tractor Co., Dept. D-92, Peoria, Illinois
I would like more information on the new No. 9 Ripper

Name _____
Company _____
Address _____
City _____ Zone _____ State _____

Tuffy® Tips



If Present Rope Is Correct Size, Measure with a Caliper



Measuring the Wrong Diameter

is a common mistake that some buyers make when they order replacement rope. When the rope arrives, it turns out to be too small—even though a machinist's caliper was used to assure accuracy. It's an easy mistake to make, but it's just as easy to remember the *right* way and be sure you get the right size rope. Otherwise both the safety factor and service life of the rope will be reduced.



Measuring the Right Diameter

is the simple step shown above. Measure so that a single strand is on each of the adjustable edges of the caliper—not two strands that measure as a flat side. The actual diameter of a wire rope is the same as that of the circle required to circumscribe it. The diameter of a wire rope is an important factor in determining the safe working load to be handled by your equipment.

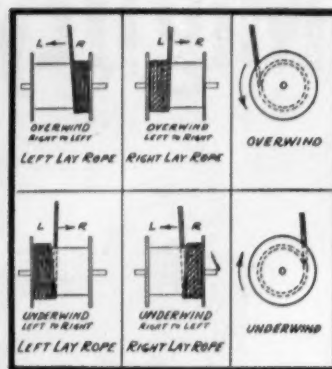
How To Measure Groove Diameter



Shown above is the **WRONG** way to measure the groove diameter. The result—shorter life of the wire rope you buy. Note that only the sides of the rope will bear on the sheave. In a relatively short time this will squeeze the rope out of round and set up destructive friction and stresses on the rope strands and wires. New rope is over-size and diameter of grooves on sheaves and drums should be slightly larger.

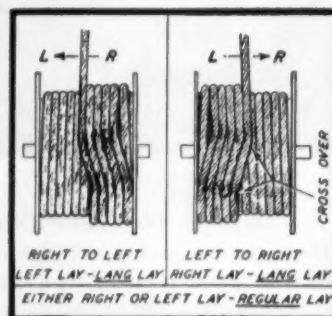


Shown above is the **CORRECT** way to measure the groove diameter. It is a simple thing to do and will give the rope you buy a chance to deliver all the service it possibly can. Remember a wire rope is composed of many closely correlated working parts and sheave grooves which are too large or too small throw them out of alignment. Just like any other working part on a machine, wire rope cannot do its best if it is misfitted.



Rope Lay for One Layer Winding

These diagrams show when it is best to use right lay or left lay rope on one-layer winding. The direction of winding is determined by standing behind the drum, looking toward the direction of the rope travel.



Rope for Two Or More Layer Winding

When a rope winds on the first layer across the face of a drum, it usually travels in a uniform pattern. But when it reaches the flange of the drum, the rope rides on the last strand of the first layer for one turn. Then, it slips into the grooves between each course of rope on the first layer. To move across the drum in this manner, the rope actually winds *back* a turn in each revolution. Then it must jump across two grooves in the first layer. This always occurs on the even-numbered layers, and often causes crushing. This abuse is minimized by use of properly designed grooves, spacers and lifters.

In Shoes Or In WIRE ROPE Misfitting Is Hard On The Pocketbook



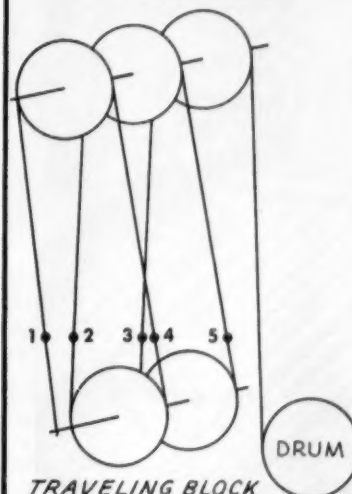
Replace Worn Sheaves

Check for sheaves that have been badly worn. Sheaves that have grooves corrugated by the rope lay impression should be replaced immediately before installing new rope. Since rope creeps to a certain extent on sheaves these grooves can actually cut the strands as the rope runs over. This will greatly reduce service life of any wire rope.

Breaking In New Rope

After a wire rope is installed, it is advisable always to run the new rope with a light load or with no load for a short period of time. This "breaking in" process gives the component parts of the rope an opportunity to adjust themselves to the conditions under which the rope is to operate. The time spent "breaking in" a wire rope will pay dividends in extra useful rope life.

How To Count The Number of Parts Supporting the Load



Draw an imaginary line across the parts of the rope supporting the load.

The wire rope on many machines is not used in a single or direct pull. It is often reeved through sheaves, which gives a mechanical power advantage.

Send For Free Chart Which Allows Easy Figuring of Actual Stress On Rope For Any Given Piece of Machinery Reving From One to Eight Parts.

Don't Say "Wire Rope"—say **Tuffy**



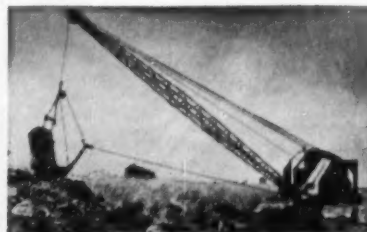
Tuffy Slings & Hoist Line

Machine braided slings that consistently keep costs down, keep safety records clear. A tough, flexible hoist line. A balanced team.



Tuffy Scraper Rope

Special construction assures resistance to drum crushing and the strains caused by angle pulls through swivel-mounted sheaves, rapid line and shock of load on slack line.



Tuffy Dragline



Outer wires offer large area to resist abrasion... inner structure made for flexibility. The result is a rope that casts freely, fights off shocks and line pulls.



Tuffy Dozer Rope



Get extra dozer rope service—mount a 150' reel of Tuffy on your dozer, feed through only enough to replace damaged section on the drum. 1/2" and 9/16".

Your Tuffy Distributor Works to Learn Your Business

When new equipment comes out, he has already checked into it... finding out why it does the job better, how it works. Why? Because he's interested in earning your continued patronage. And part of that service is helping you out with fast answers when you need them—especially right answers to your wire rope problems. Give him a call.

union Wire Rope corp.

2270 Manchester Avenue Kansas City 26, Missouri
Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

As soon as the form was filled, it was spun at 350 rpm for about 4 min. This completed the compaction and removed a large part of the mixing water. When spinning was finished, the overhead crane lifted the form, upended it, and lowered it on to a hand car. After 30 min of air curing, it was pulled into a steam curing shed that had a capacity of 32 sections.

After 5 hr the form was removed from the shed and stripped. Mandrel and hoses were pulled out first. Then men atop a platform that rode up and down next to the form removed bolts with pneumatic wrenches and opened the form's seam.

Little time was lost getting the form back into service. One of the three overhead cranes picked it up and lowered it over a post mounting a group of rotating wire brushes. A single lowering quickly cleaned the inside of the form. The crane then moved the form to a special spindle inside a tank that sprayed oil on the interior of the form. Cleaned and oiled, the form was placed on a hand car, and the concreting cycle repeated.

Meanwhile, the completed 16-ft concrete section was sprayed with curing compound and taken to a storage area. After two weeks it was hauled by a special Clark lift truck to prestressing racks, where it was joined with identical sections and stressed into a pile.

Pile Prestressing

Prestressing racks extended from two opposite sides of a shed that housed reels of wire and jacking equipment. Each rack was long enough to accommodate two piles end to end, which permitted crews to prestress four piles at once.

Here's how it was done: A lift truck placed enough sections along the edge of each rack to make the required lengths of two piles end to end. Sections were then rolled one by one across the rack and on to a line of dollies with roller seats. Rollers made it easy to rotate the sections and line up the 12 longitudinal prestressing ducts, while the dollies permitted sections to be pulled together, and also allowed the pile to move when prestressed. A steel ring separated the two piles of each pair and provided holes at the ducts for wires. Joint surfaces between sections were coated with a special resin gluing compound before they were pulled together.

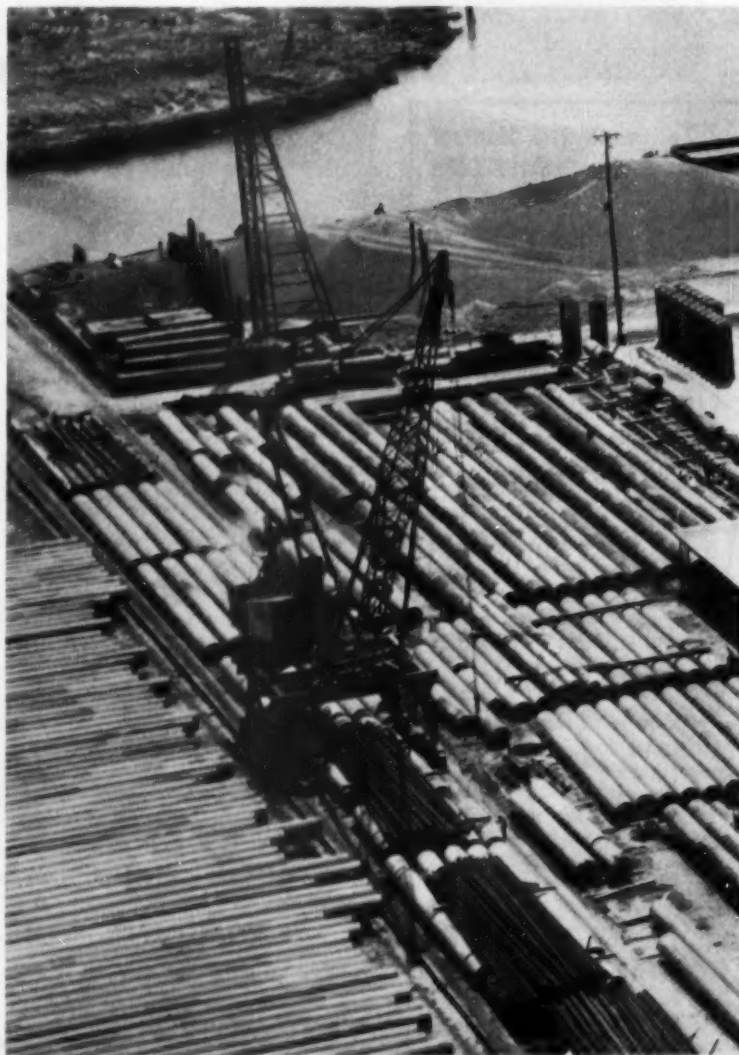
Each pair of end-to-end piles was then ready for prestressing. A feeding device operated by air wrenches pulled 0.192-in. dia Roebling wires from 12 spools and pushed the entire group through a duct at the rate of 100 fpm. Two ducts were threaded at a time. At the far end of the piles, each group of 12 wires was anchored by cone-type wedges. And at the near end, they were burned off to permit jacking.

When all 12 ducts were fitted with wires, two groups at a time were prestressed. Wires were wedged into the splines of two Freyssinet-type 36-ton jacks, and

pressure was applied simultaneously. Jacks elongated about 1 in. for each 16-ft section and stressed the wires to 150,000 psi. When each group was stressed, cone anchors were driven, the jacks removed, and grout pumped in at 100 psi.

The two piles, still joined together, then were rolled to an adjacent rack and stored from one to three days. Crews burned the wires between the two piles and removed stubs on the ends. A 75-ton whirler crane hauled piles from storage area to barges. Expert handling cut breakage to the minimum.

Continued on page 70



7

WHIRLER CRANE moves through storage yard to pick up long prestressed cylinder piles and haul them to barges for delivery to floating driving rigs.

The Engineer's Field Report

CASE HISTORY

RPM Multi-Service
LUBRICANT Gear Lub.

Rothschild, Raffin & Weinick
FIRM San Francisco, Calif.

"No trace of wear" in gear boxes or rear ends after 4½ years of heavy construction work!



WORKING AT CHERRY VALLEY DAM in California's High Sierra, RR&W operates a wide variety of heavy equipment in handling all concrete requirements. For complete protection on this job and to prevent costly maintenance, the firm uses RPM Multi-Service Gear Lubricant in all rear ends and gear boxes. Heard Bonner, Master Mechanic, reports "my Chevrolet pickup has 96,000 miles on it and it's never been worked on. We haven't lost a rear end or a gear in in almost five years of tough work. Every rear end we've ever inspected has been completely clean without a trace of wear."

The 163 h.p. Scoopmobile (above left) loads aggregates at batch plant. The Northwest crane (right) with a Murphy diesel engine, lifts and positions 8-ton, 15'4" OD tunnel liner sections. Other RR&W equipment using

RPM Multi-Service Gear Lubricant includes four ready-mix trucks, three dump trucks, a 3/4-yard Unit crane, and three bulldozers.

Why RPM Multi-Service Gear Lubricant prevents wear in severe conditions

Contains a special compound that reacts chemically with metal to form a protective lubricating coating...resists rubbing action of hypoid gear teeth.



Withstands extreme temperatures and pressures...highly oxidation resistant. Keeps gears and bearings cool. Inhibitors resist rusting, stop foaming in cases. Lubricates integral bearings and other parts. Will not separate.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your distributor, write or call any of the companies listed below.

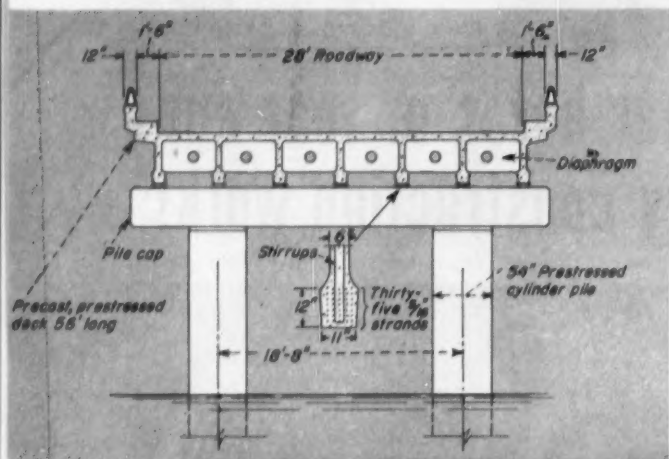


TRADEMARK "RPM" REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

PONTCHARTRAIN BRIDGE...

continued from page 66



MONOLITHIC SLAB 56 ft long rests on pile-supported caps. Deep, irregular shaped stringers are integral with slab.



STRAIGHT as an arrow, bridge advances toward shore. Anchor bolts and bottom bearing plates are precast with caps.

Fast Cycle Turns Out Eight Slabs a Day



BED of steel slab forms with stringer side panels retracted is cleaned and oiled. Panels are mounted on beams that slide back and forth under slab.

IT TAKES THE BEST TECHNIQUES of mass production to produce 200-ton precast, prestressed slabs at the rate of eight per day. And except for a few interruptions, Louisiana Bridge Co. maintained that schedule for the full length of the job.

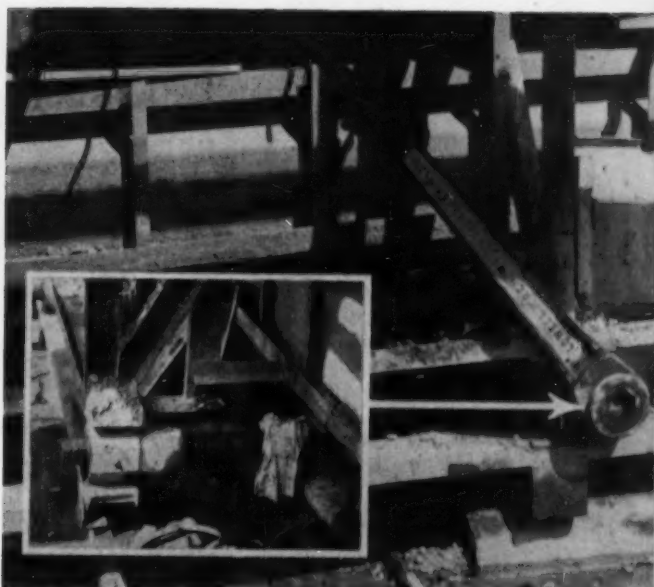
They invested a lot in the huge plant, but it paid off. Rejections were virtually non-existent, and precast units fitted together without difficulty. They had to; you just don't leave anything to chance when anchor bolts and bottom bearing plates are precast in caps, and top plates are precast with slabs. There's no room for adjustment out on the lake, they have to be right the first time.

Slabs and pile caps were cast in a 20-acre area on one side of the plant. There were three lines of parallel beds—two outer lines for casting and an inner line for prefabricating the reinforcing. On one outer line, two beds end to end each had a capacity of eight slab forms. The other outer line consisted of one bed of eight slab forms and one bed of 40 cap forms.

Both outer lines of beds were serviced by a specially built American 200-ton gantry. Riding on a pair of standard-gage tracks, it straddled the beds and hauled pre-



END OF FORM with bulkhead removed shows pin holes for locking panels and cover plates to hood-type extensions on bulkhead.



HAND LEVER connected to screw with left and right-hand threads (inset) slides panel-mounting beams in opposite directions.

cast units to barges for transportation to the placing site.

Concrete pouring had to follow a rigid schedule to turn out 48 slabs per week. The operation worked on a three-day cycle. One day a group of eight was poured, the next day they were cured, and the third day they were stripped. Operations on the three beds were staggered so that on any one day, one bed was being poured, a second cured, and the third stripped.

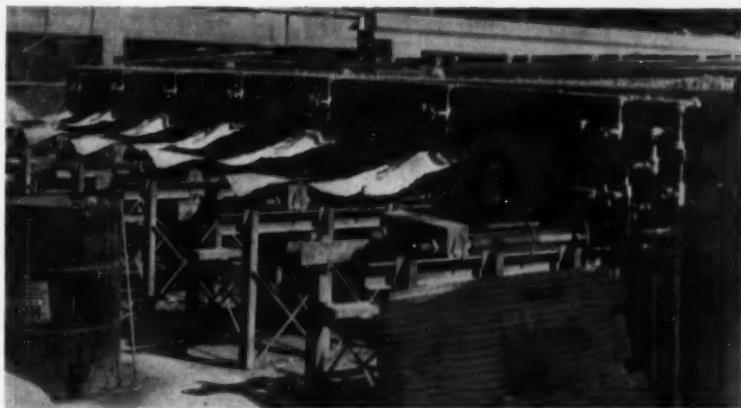
Slab Forms

Slab forms had a big job to do. They had to be strong enough to contain the 200-ton slab within rigid tolerances, durable enough to withstand nearly 100 reuses, and flexible enough for fast and easy assembling and stripping.

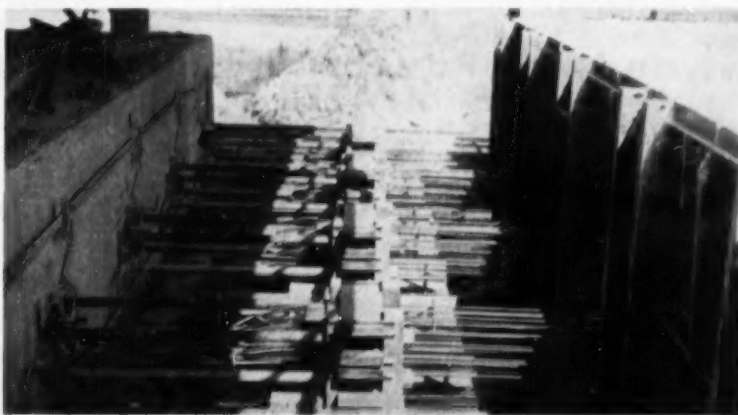
To meet these tough requirements, the contractor developed ingenious retractable steel forms mounted on solid foundations to prevent even the slightest settlement.

Key feature was fast, simple retracting of the vertical panels that form the sides of the seven stringers that were integral with the slab. The entire operation was done from outside the bed and required only a few seconds. Nine men each pulled large lever wrenches at the same time, and the vertical panels moved into or away from the stringers, depending on which way the levers rotated.

Continued on page 75



BANK of seven Pine screw-type jacks operated by hydraulic motors bucks against concrete abutment. Control panel synchronizes movement. Jacks elongate 32 in.



GROUPS of four long rods each pulling grillage of 25 strands run through holes in abutment (left) and connect to jacks. Eight slabs are pretensioned at the same time.



REX Is Your Profit-Wise Choice

...in Pumps...in Building Mixers...in Truck Mixers

Rex Speed Primers are the "pumps that never let you down." Only Rex has the exclusive adjustable air peeler that assures new-pump efficiency for the life of the pump. Simple design...easy accessibility...light weight make Rex your choice for dependable pumping service. Capacities from 4,000 to 90,000 g.p.h.

Rex Building Mixers alone give you the correct basic design for fast charging and discharging. Rex tows much easier...spots much faster...and has the true operator convenience that really cuts down fatigue...means more yards per day. In 3½-S Tilter and Skipper models... 6-S, 11-S and 16-S models.

Rex Adjusta-Wate Moto-Mixers® have the unique design principle that adds up to biggest profits. The Adjusta-Wate principle offers the flexibility that reduces hauling, operating and delivery costs. And Rex Moto-Mixers always mix and deliver quality concrete regardless of slump. 3½-, 4½-, 5½-, 6½-, and 7½-yard models.

...and, for Pavers and Pumpcrete®, too,

See your Rex distributor

FOR INFORMATION, WRITE CHAIN BELT COMPANY, 4664 W. GREENFIELD AVE., MILWAUKEE 1, WISCONSIN



CONSTRUCTION MACHINERY

MOTO-MIXERS®

MIXERS

PUMPS

PUMPCRETES®

PAVERS

New CAT* **LOWBOWL** Scrapers handle big production on California highway job



Among the Caterpillar units at work for Gordon H. Ball on this job are eight DW20-No. 456 LOWBOWL Scrapers, one D9 Tractor, three D8 Tractors, a No. 12 Motor Grader and a Cat Engine in a compactor. Standardizing on heavy-duty yellow equipment pays off in production, parts availability and maintenance. There's one prompt, reliable source of service—the nearby Caterpillar Dealer.

Working on the construction of a 2.6-mile bypass near Lafayette, California, Gordon H. Ball has eight new four-wheel Cat DW20-No. 456 LOWBOWL Scrapers handling the job, estimated at 1,500,000 cu. yd. The material is sandstone clay. Mr. Ball, whose company has used Caterpillar equipment for 35 years, is more than satisfied with the production of the LOWBOWL units. They are moving about 10,000 cu. yd. in an eight-hour day.

On job after job, you hear similar reports about new Cat LOWBOWL Scrapers. When matched against competitive units under identical conditions, these rigs have delivered bigger, faster loads. Here's why: The No. 456's LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads. And the DW20's new 300 HP (maximum output) Turbocharged 6-cylinder engine delivers 10% more rimpull and a top speed of 32.1. There's power aplenty for hauling heavy loads and for fast round trips, even against adverse

grades. Another plus: New tubeless tires on scraper and drive wheels, available at no extra cost, eliminate an estimated 80% of down time caused by tires.

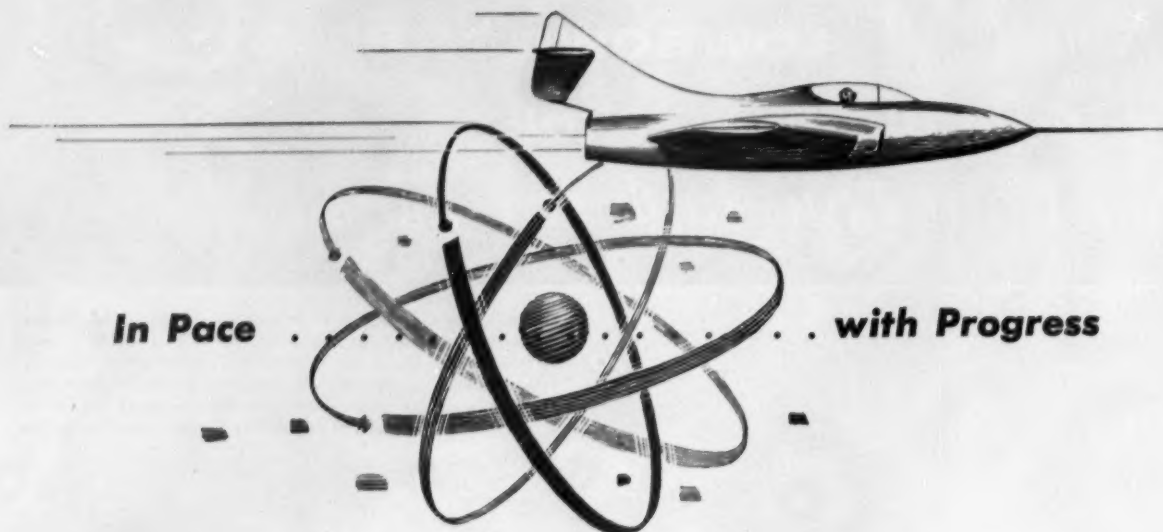
Besides the four-wheel DW20-No. 456, there's a two-wheel DW21-No. 470. Both LOWBOWL Scrapers are cable-operated and have a capacity of 25 cu. yd. heaped and 18 cu. yd. struck. Both are ruggedly built to move more earth faster at lower cost with less down time. For facts and figures about LOWBOWL superiority on actual jobs, see your Caterpillar Dealer. Name the date—he'll be glad to demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**BIGGER, FASTER
LOADS WITH CAT
LOWBOWL SCRAPERS**



In Pace . . . with Progress

True GUN-ALL

Wet-mix pneumatic concrete

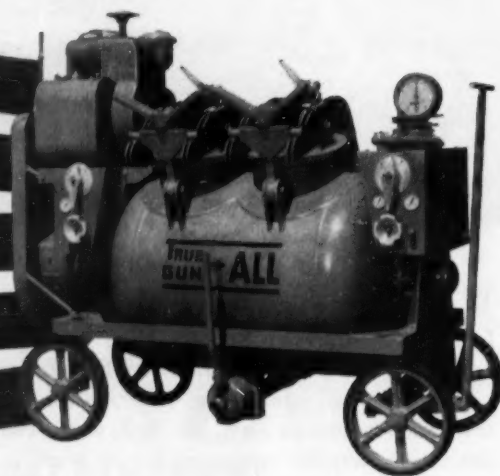
UP TO 4 CU. YD. IN PLACE PER HOUR

LESS THAN 10% REBOUND

125 CFM ROTARY AIR FOR NORMAL OPERATION

NO GUESS WORK — WATER RATIO MECHANICAL

LOW OVERALL INVESTMENT



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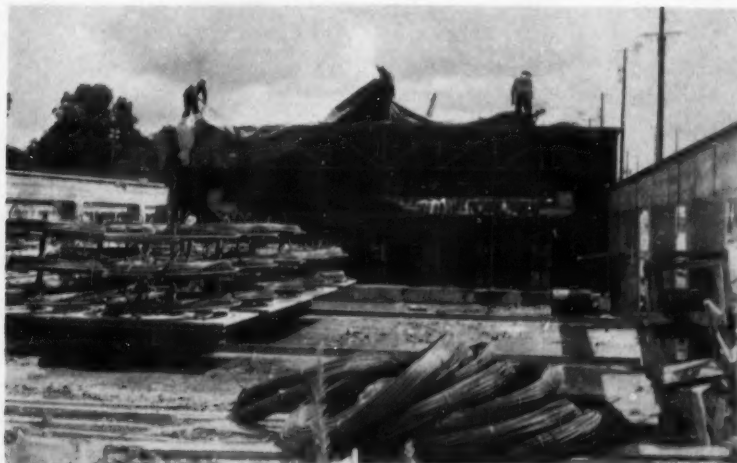
P. O. Box 2526 • Tulsa, Oklahoma



CONCRETE is dumped from crane-handled 2-yd. bucket and vibrated into stringers. Blaw-Knox finisher with modified reciprocating

screeds rides on elevated rails. Finishing bridge follows. After about 9 hr., curb is poured along each edge.

PONTCHARTRAIN BRIDGE . . . continued from page 71



TARPS are draped over curing sheds that ride on elevated rails. Note swift car loaded with strands for next stressing. Steam escapes (below) during 9-hr. curing period.



Here's how it worked. All stringer side form panels were mounted on top of steel beams that slid back and forth transversely on greased supports under the slab. There were nine pair of beams, and the beams in each pair always moved in opposite directions. This meant that when the hand levers were rotated, nine beams slid one way while nine others slid in the opposite direction. By mounting panels on the proper group of beams, the contractor could easily control their movement to form up or strip the stringer sides.

The connection between each lever and its pair of beams was accomplished with a large-diameter screw that had both left and right-hand threads. With one beam connected to the left-hand thread and the other to the right-hand thread, the screw's rotation moved the beams in opposite directions.

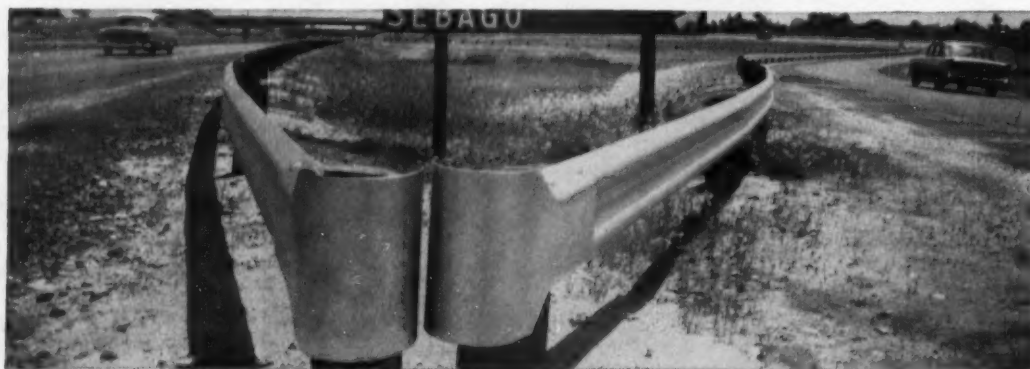
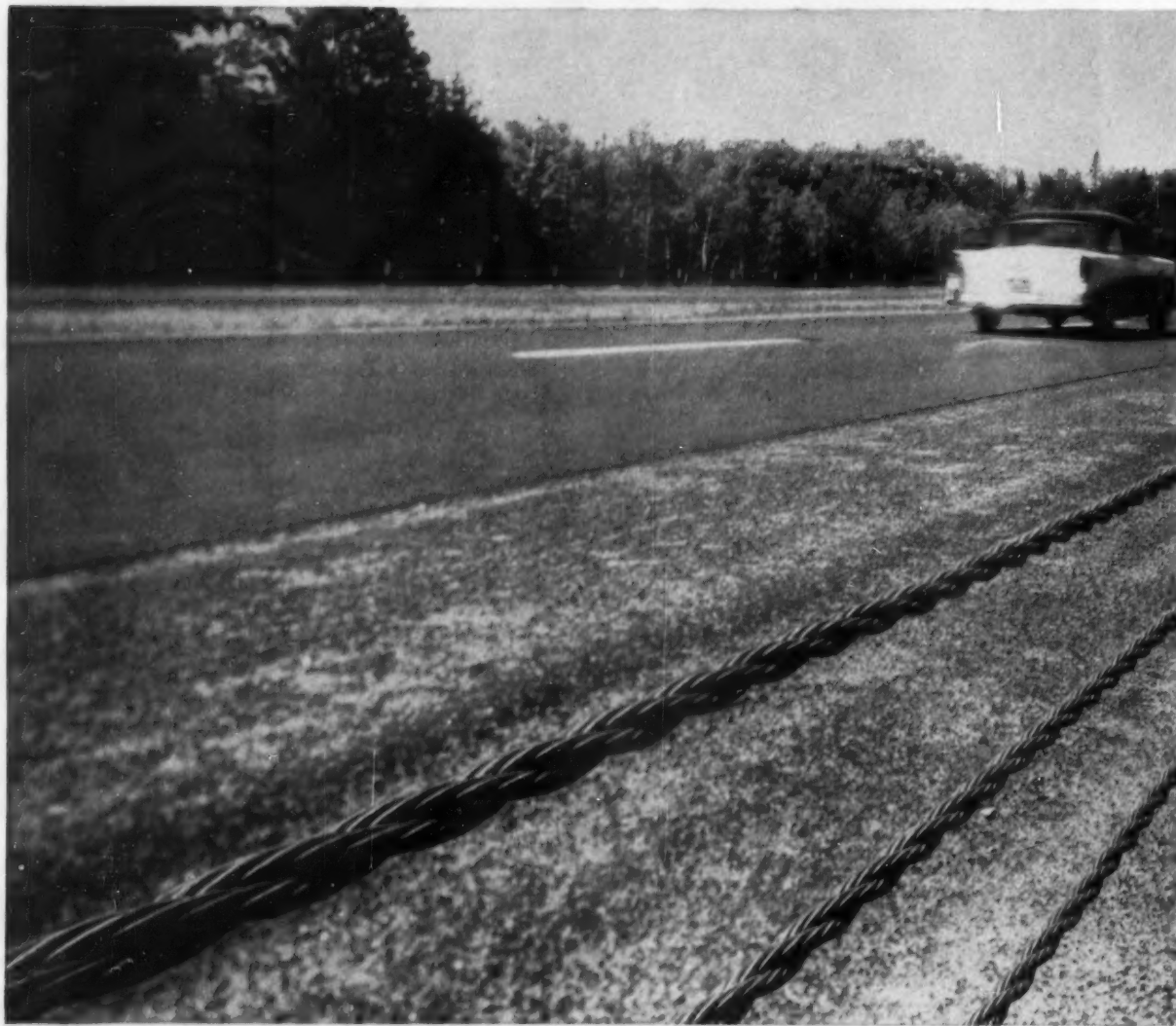
Form panels were made of heavy steel plate shaped to conform to the irregular sides of the stringers and the curved transition at the slab's horizontal underside. Heavy plates formed the diaphragms and also the underside of the slab.

The retractable feature really paid off. A few twists of the hand levers and the sides of the stringers all were stripped simultaneously. Curb forms could then be removed, and the slab was ready to be lifted out by the gantry.

(Continued on page 79)

On New Maine Turnpike

Two types of **COMBINE SAFETY WITH**



American Highway Guard

GOOD APPEARANCE



▲ American Multisafte Cable Highway Guard, like this used on the new Maine Turnpike, provides two-fold protection. First, it restrains cars from plummeting off the berm. Second, the combination of resilient steel cable and resilient spring-steel offset brackets cushions the shock of collision and helps minimize damage to the vehicle, serious injury to the passengers.

◀ American Beam-Type Highway Guard is also used on parts of the Maine Turnpike. It provides a strong, attractive, durable guard.

THE MEN who designed the Maine Turnpike needed two types of highway guard. Along some sections they wanted to use cable guard; at other sections, they wanted beam-type guard. They obtained *both* types from American Steel & Wire. American Multisafte Highway Cable Guard and American Beam-type Highway Guard assure an economical installation that will stay attractive *and* protective with minimum maintenance. With these two guards they combined essential safety with desirable good looks.

American Multisafte Cable Guard comes in two basic types: 3-cable guard, which gives adequate protection at highway speeds up to about 50 miles per hour; and 4-cable highway guard, which protects up to about 75 miles per hour. A Super Guard consists of six or eight cables for special situations, where an extraordinary margin of safety is desired. In any installation, cables can be added or replaced quickly and easily if changing highway conditions demand additional protection.

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USS Multisafte Highway Guard



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Link-Belt Speeder gives you up to

40% more usable horsepower

greater line pull . . . bonus power to dig, hoist, swing, travel

Link-Belt Speeder machines are built to take full advantage of the "bonus" horsepower available in shovel-crane engines!

SIZE for size, a Link-Belt Speeder gives you more usable horsepower. You get more line pull, more power at the bucket teeth . . . more power to swing, hoist and travel. That's because a Link-Belt Speeder takes more power out of its engine!

You see, a Link-Belt Speeder is built with extra strength—strength to handle greater horsepower. Thus, the engine in a Link-Belt Speeder can be (and is) set to deliver the greater horsepower for which the machine is designed. Link-Belt Speeder

gives you a bonus of up to 40% more usable horsepower than machines using the same make and model engine! And, in every instance, the engine in a Link-Belt Speeder is run at speeds well within the manufacturer's recommendations.

How to compare

Your Link-Belt Speeder distributor will furnish complete specification information. Check sizes and materials in Link-Belt Speeder shovel-crane that allow you to use the actual horsepower you are paying for. **LINK-BELT SPEEDER CORPORATION**, Cedar Rapids, Iowa.

14,248

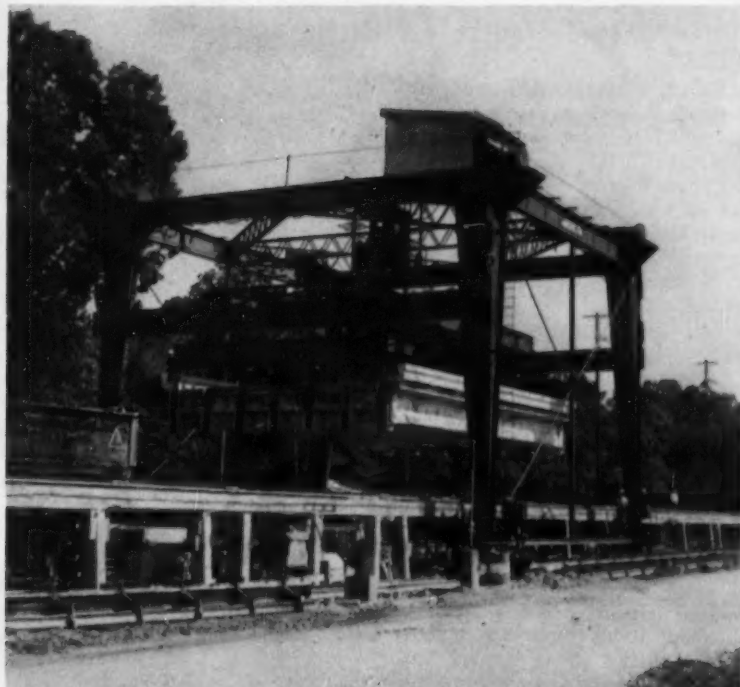
LINK-BELT SPEEDER

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TWO PAIRS of standard parallel track flanking beds merge over barge-loading dock.



GANTRY carrying 200-ton slab heads for loading dock. Bulkhead form serves as lifting frame. No inserts are required. It pivots backward on gantry for quick removal.

PONTCHARTRAIN BRIDGE . . . continued from page 75

Retracting had other benefits, especially when the forms were being prepared for pouring. Retracted, the forms provided about 1½ ft of working space at the stringers and made it easier for workers to clean panels.

Fast Cycle

Let's trace the 72-hr construction cycle of a typical group of eight slabs—starting just after the previous group had been hauled to barges.

Workers with pneumatic brushes and hand tools quickly cleaned the forms. Oil was sprayed on all surfaces, the top halves of the bearing plates were placed, and the forms were closed.

Prestressing strands then could be installed and pre-tensioned. A rail-mounted swift car at the anchorage end of the bed was positioned opposite the first line of stringers. Strands of ¾-in. cable, supplied by Union Wire Rope Corp., were pulled from 25 coils and fed through a plate mounted on a steel anchorage abutment. Just beyond the plate, the strands were inserted into a templet on a pull sled and held with Reliable grips.

An air tugger pulled the sled, with its 25 strands attached, the full length of the 490-ft bed. At

the far end, the grillage and strands were removed from the sled and placed in a steel frame that could slide on short rails. Strands were burned off at the other end, anchored, and the operation repeated for the remaining six lines of stringers.

To stress the strands, the frame had to be pulled on its rails away from the bed. This was done with four long bolts that ran from each frame to a Pine 200-ton screw-type jack operated by a Pesco hydraulic motor. The bolts passed through holes in a concrete abutment against which the jacks reacted. All seven jacks were connected to a common control panel to synchronize jacking.

An elongation of about 32 in. stressed the strands the required 160,000 psi. In case of failure in the hydraulic lines, a screw device capable of holding the load was moved up with the head. Greased mountings allowed slabs to move longitudinally.

Reinforcing

During prestressing, reinforcing was fabricated on jigs in the area between the two lines of casting beds. When stressing was completed, stirrups were placed in the stringer forms, and assembled mats



BULKHEAD FORM with lifting brackets at bottom is returned and locked to slab form.

for the deck were hoisted intact by a crane and set in place.

When all reinforcing and fixtures were installed, concrete placing followed right behind. Methods

PONTCHARTRAIN BRIDGE...

continued

were conventional. A crane swung 2-yd buckets over the slabs, and concrete was vibrated thoroughly, especially in stringers.

Concrete was placed in two pours, 9 hr apart. Stringers and deck were first, and curbs were second. The deck was finished by a modified Blaw-Knox self-propelled screed riding on elevated rails just beyond the sides of the slab. Double screeds were reciprocated by special brackets and extensions. Behind the screed, workers stood on a special crossbridge and finished the surface. The deck was sprayed with Hunt curing compound.

Along the two edges of the slab, the surface of the deck was brushed and covered with burlap to help bond it with the curbs poured later. When the deck was finished, it was covered with steel-frame curing sheds draped with tarps. These rode on the same elevated rails as the screed. The slabs were steam cured for about 9 hr, the sheds removed, curb forms placed and poured, and the complete unit steam cured for another 9 hr. A constant setting time was maintained by adding Plastiment to the mix.

When concrete reached a strength of 3,000 psi, prestressing strands were cut and forms stripped. Before cutting the strands, crews released the jacks, and strands were burned off between each slab. Forms were stripped quickly by a crew of nine men with hand levers.

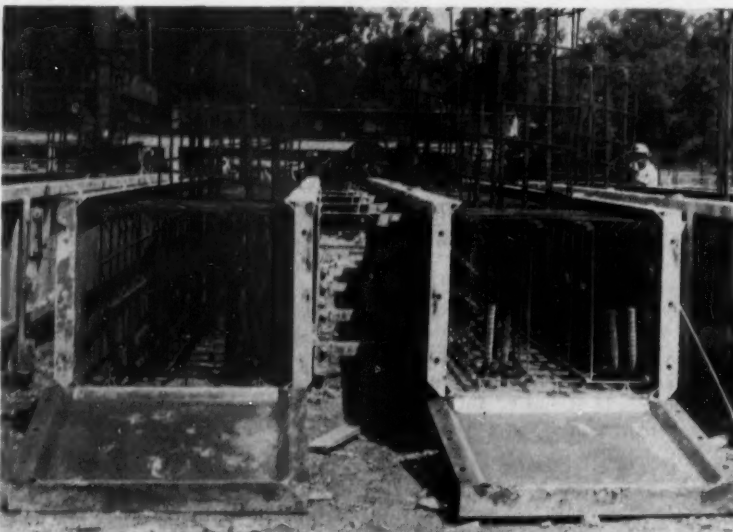
When a slab was ready to be moved, the four-leg electric gantry positioned itself above and slowly lowered steel fingers into pickup slots in the form's heavy steel bulkheads. Short forks mounted on the bulkhead fitted under the stringers and greatly simplified lifting. This method eliminated the need for pickup inserts and proved very fast.

Slight uplift from the gantry broke any remaining bond between slab and forms, and the 200-ton precast unit was hoisted into the crane's steel frame. With a clamoring of bells, the big rig rode to waiting barges and placed the slab on a steel cradle.

The steel bulkheads were then pivoted away from the ends of the slab, hoisted, and hauled by the gantry back to the form. Here, they were lowered in place and pinned to the form. Hood-type extensions on the bulkheads served as



BASES of forms for upside down pile caps are oiled before pouring. Note recesses for anchor bolts and bottom bearing plates. Heavy reinforcing cages are prefabricated



STEEL SIDE FORMS are wedged behind angles attached permanently to form base. Braced against each other, sides pivot outward for stripping. Bulkheads bolt to side panels.

forms for end diaphragms and also locked the entire slab form together.

At this point, the casting cycle was ready to be repeated.

Casting Caps

Pile caps were 32 ft long, 3½ ft wide, and 3 ft deep. Because of two projecting reinforcing cages, which had to be inserted later in the pile tops, the caps were cast upside down. Slots in the base of the forms permitted bearing plates to be cast with the cap.

Side forms consisted of steel panels braced against adjacent cap forms. Bulkheads were bolted to side forms.

Caps were poured by crane and bucket. They were covered with

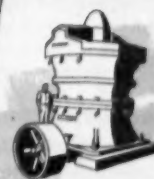
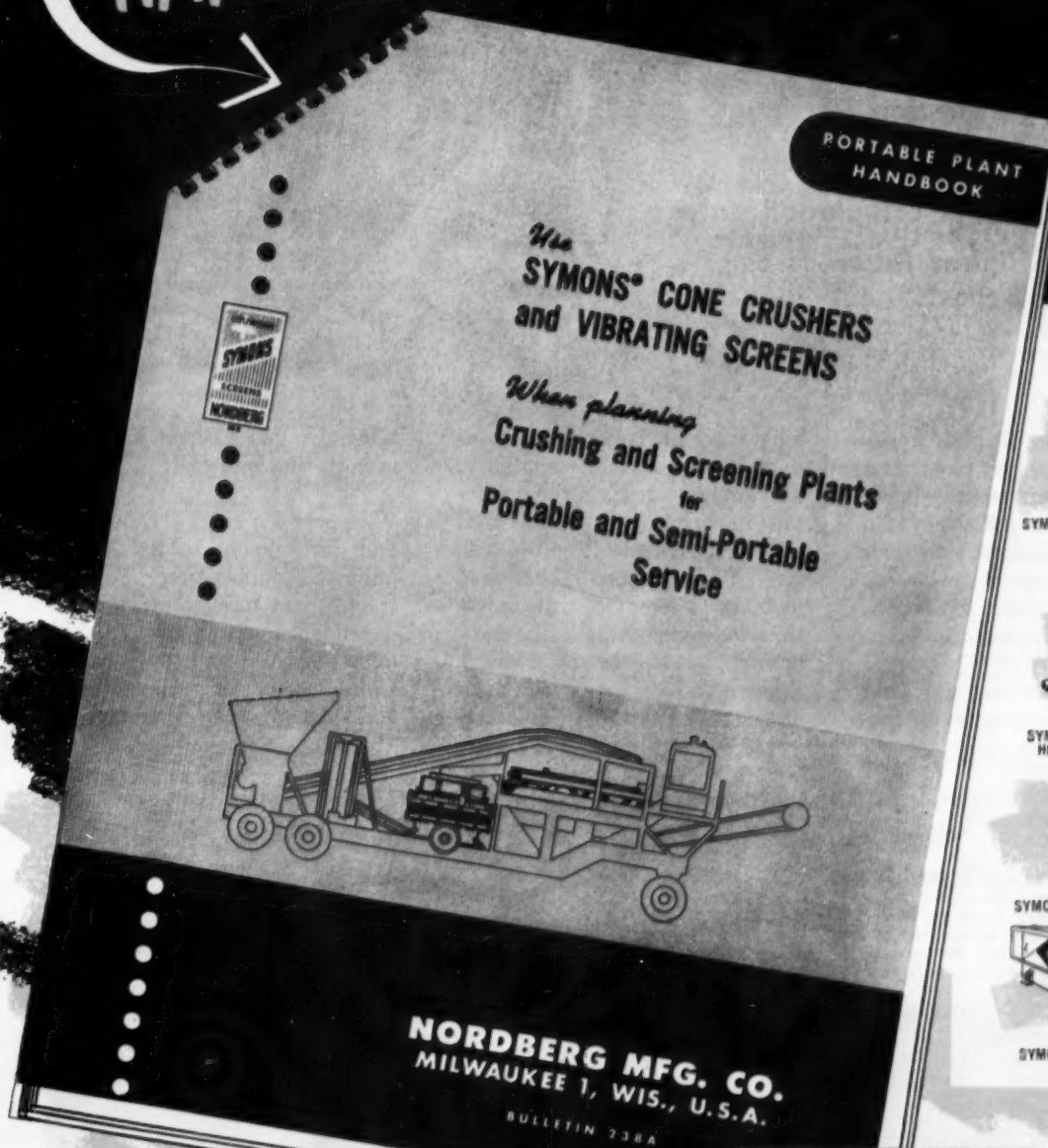
tarps and steam cured at 100 deg for 12 hr. The next day forms were stripped. Braces between adjacent caps were sprung, and side forms moved away from the concrete. After three days the concrete reached a strength of 2,000 psi, and the gantry moved them to barges.

Personnel

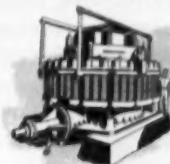
James E. Walters was project manager, David Milhan was chief engineer, James Quillan was day shift superintendent, and Walton Gasaway was night shift superintendent for Louisiana Bridge Co. Brig. Gen. Joseph Twitty, USA (ret.) was chief resident engineer for Palmer and Baker, Inc., who designed the bridge and supervised construction.

Send for this NEW HANDBOOK...

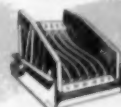
• Just off the press, this new 26-page Nordberg Portable Plant Handbook is full of suggested layout arrangements showing how to use *Symons Cone Crushers* and *Symons Vibrating Screens* with other related equipment in making up complete portable and semi-portable crushing and screening plants. If you are a user of crushers and vibrating screens, and are thinking of mobility, you'll want a copy of this new handbook. Fill in and mail the coupon today for your free copy.



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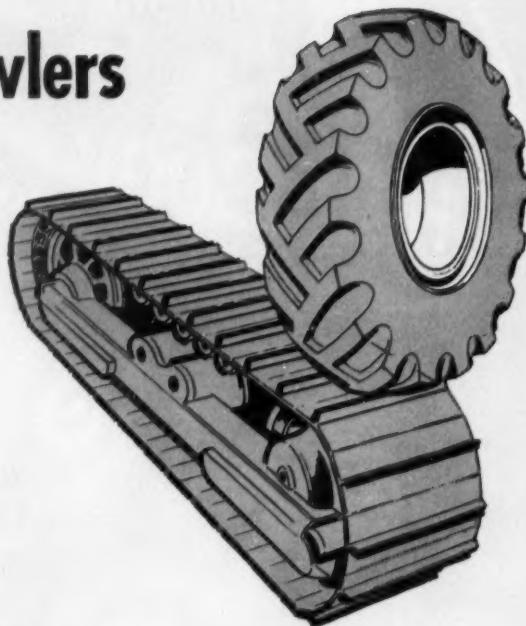
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C656

There's a place for crawlers and a place for rubber

in meeting your dirtmoving problems

1. Larger job yardage
2. Increased job area
3. Earlier completion dates
4. Higher labor costs



Crawler tractors fit your applications where lugging power is a maximum requirement. They have maximum efficiency in limited-area operation. Here their traction advantage at low speeds can offset their speed limitations on medium or long-range cycles.

Rubber-tired tractors fit your applications where speed and mo-

bility become important dimensions in your dirtmoving problem. The longer your cycle the greater the importance of speed that only rubber-tired tractors can give. You also need rubber-tired mobility where frequent moves from one assignment to the next, or from job-to-job, are involved. Where you have long cycles and/or frequent moves, crawler limita-

tions give you a severe handicap in both time and cost.

With over ten years of experience and development behind it, our improved rubber-tired Tournatractor, can meet your need for dependable performance, with a minimum of competent regular maintenance. Operation is easy and safe. When inspection or re-

Filling around large culvert, 17 mph rubber-tired tractor moves dirt fast. Tournatractor's travel speed and flexibility of application enables you to expedite scattered job assignments that need to be done in a hurry.



pairs are necessary all parts are easily accessible and can be replaced quickly and simply.

Take a new look at the modern Tournatractor. Study it from the angle of your assignments where you need new standards of speed and mobility. Remember, these two dimensions will become even more important in the big highway programs ahead. Study your crawler cycles, but not just on basis of the biggest load in the shortest distance. Measure in *time* rather than *distance*. Measure load-time, carry-time, return-time. Find out the percentage of time you lose in moving from one assignment to the next.

You measure production on your scrapers, your shovels, your pavers, your drills. It's also important for you to carefully study the one major tool you've probably taken for granted . . . your tractor. To be sure, yardage measurements are impossible on most of their production . . . but you can definitely time their moves and cycles over a substantial period; to your advantage.

We'll be glad to help you set up these studies if you wish. Then, when you know just what you are now getting in tractor performance, we'll be glad to show your time-study man similar operations on Tournatractor. We think the answers on the present-day Tournatractor will justify your trying at least one on your current jobs. Time-studies on assignments calling for speed and mobility will show you a big advantage in productive time . . . more work done . . . lower costs . . . greater profit.

But don't take our word for it . . . check for yourself.

Tournatractor—Trademark Reg. U.S. Pat. Off. CT-1103-G



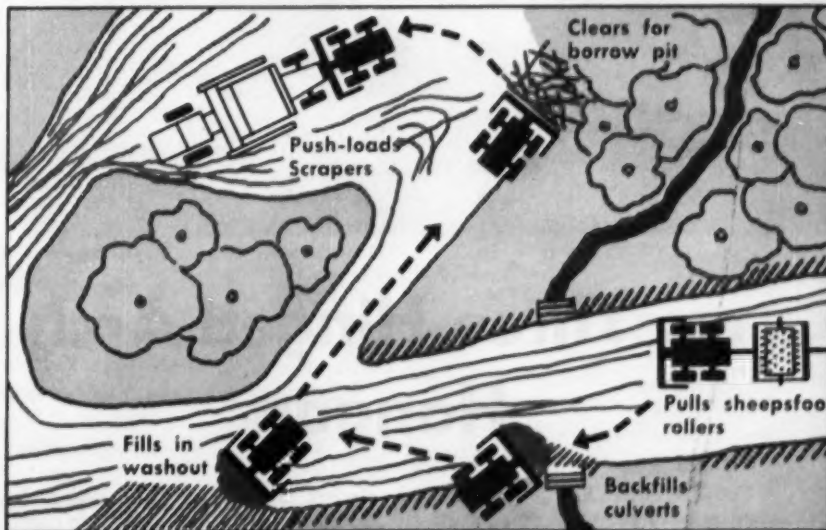
Push-loading is an important job where rubber-tired speed pays off. Tournatractor's ease-of-operation and maneuverability allow fast positioning,

gear-shifting is faster, new optional wide-base tires plus hydroflation give improved performance. Mobility permits pusher transfer to match loading need.

Work	Operation	Time (minutes)		
		Average Crawler	Rubber-Tired Tractor	Speed Saved in Min.
Dazing	Pushing load . . . 150 ft.	0.88	0.57	
	Return . . . 150 ft.	0.36	0.31	
	Gear changes	0.30	0.10	
	TOTAL	1.52	0.88	0.64
Pulling 15-yd. Scraper	Loading	0.75	1.25	
	Hauling 1000 ft.	2.10	0.76	
	Spreading	0.40	0.40	
	Return 1000 ft.	2.10	0.63	
	Gear changes	0.30	0.10	
	TOTAL	5.65	3.14	2.51
Push-loading	Loading	0.85	1.10	
	Return	0.42	0.31	
	Gear changes	0.30	0.10	
	TOTAL	1.57	1.41	0.16
Pulling 20,000-lb. Roller	600-ft. cycle travel . .	3.40	2.72	
	turns	0.30	0.30	
	TOTAL	3.70	3.02	0.68

Tournatractor travel-speed advantage is shown above. Chart compares Tournatractor's top speed with those of 3 crawler-tractors in its size range. Diagram below shows why EVERY spread needs at least one Tournatractor as a trouble-shooter. In less than 5 minutes this 17 mph rig can be at work on a new task a mile down the right-of-way. It can handle 9 one-hour assignments averaging a mile apart in a single 10-hour day.

Figures computed from manufacturers' specification sheets available to us at time of printing.

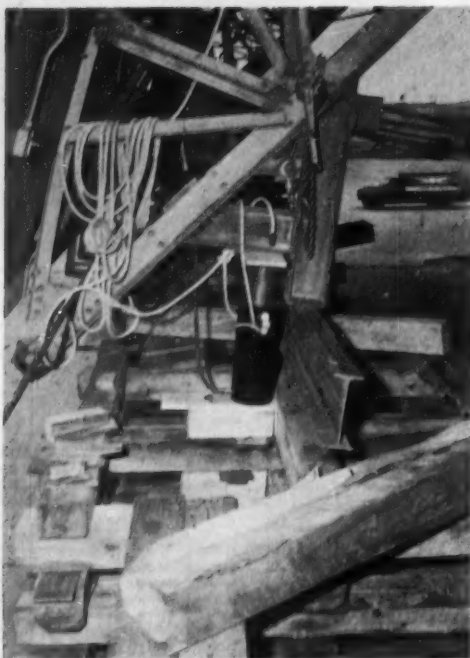


LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

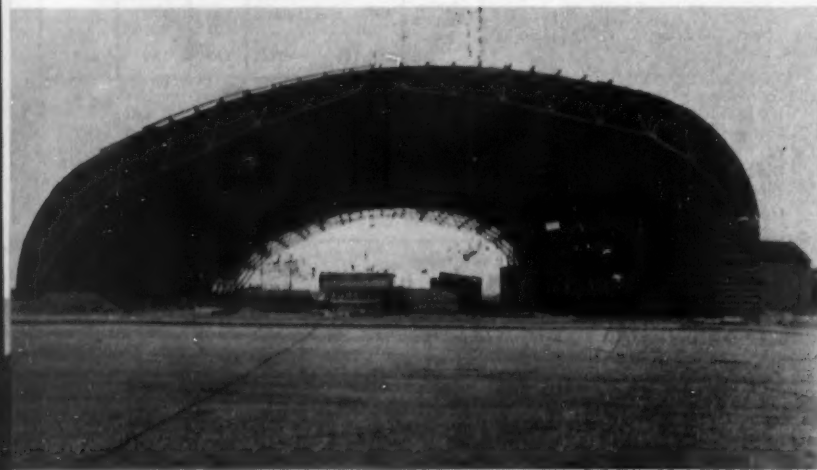
ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Jacks Tilt . . .



. . . Three-Hinged Arch Hangar

THREE BANKS of jacks enlarged an old hangar at Newark Airport, N.J., enough to accommodate large modern commercial aircraft by lifting one side of the structure nearly 16 ft.

In only nine working days, New

Jersey Erectors, Inc., of Newark tilted the 129x320-ft structure until its center height had increased from 28 ft to 37 ft. When permanent supports are completed under the jacked side, the hangar will be able to take planes with 9 ft more

tail height and 15 ft more wing span.

Because of the nature of the structure, extreme care had to be exercised right from the start. Even slight twisting or unbalancing could have collapsed the three-hinged arches. The plan called for one 100-ton jack under each of the 17 trusses.

Before any jacking could start, the contractor had to reinforce several members at the ends of the trusses. In addition, they welded brackets under the bottom chords to accommodate the jacks and help shift the load back and forth to timber cribbing.

Base hinges on each truss first had to be tied together with 1-in. cables. Otherwise, the structure would collapse when the pins were removed. The main problem was getting the proper tension in the cables to replace the reaction at the hinges.

The contractor did it one truss at a time. Each cable was tightened with a turnbuckle until most of the load was removed from the hinge. The pin was knocked out and replaced with a short piece of pipe of smaller diameter which served as a temporary pin. By adjusting a turnbuckle on the cable, workmen moved the end of the truss until the pipe pin was centered in the hole. At this point the cable had reached the proper tension.

Jacking

This operation was repeated on the other trusses until the hangar was floating vertically on its side, ready for tilting. The basic plan was to lift the hangar in 6-in. increments as the jacks were jumped up on railroad-tie cribbing.

The operation went as follows: At each truss, a 100-ton Dudgeon jack was positioned under the horizontal member of the bracket. Its base rested on a 6-in. railroad tie near the center of the cribbing.

When all jacks were positioned, the hangar was ready for lifting. A 3-cylinder pump, powered by a Wisconsin gasoline engine, pumped hydraulic fluid into three ¾-in. lines. One line supplied a bank of five jacks at the center of the hangar, and the two other lines fed two outer banks of six jacks each.

To keep the three banks of jacks raising at the same speed, an operator maintained similar line pressure in each bank. He watched three gages as he made fine adjustments with valves.

Continued on page 87

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Atlas Construction Company, Vidalia, Louisiana, has the contract for a 70-mile irrigation ditch for an important flood control project in Arkansas. Gulf lubricants and fuels help keep every unit of equipment running smoothly on a tough operating schedule of 24 hours a day, 7 days a week.

With higher-than-ever operating costs threatening your profits, it will pay you to take stock of the advantages Gulf offers as a supplier of petroleum products.

Advantages like these: Quality lubricants that provide an extra margin of protection against mechanical delays; fuels that insure top engine performance; prompt delivery service from close-at-hand distribution points; and helpful petroleum engineering counsel.

You will find, as have so many leading contractors—ask Atlas Construction Company, for example—that these advantages add up to smoother operation and lower maintenance costs.

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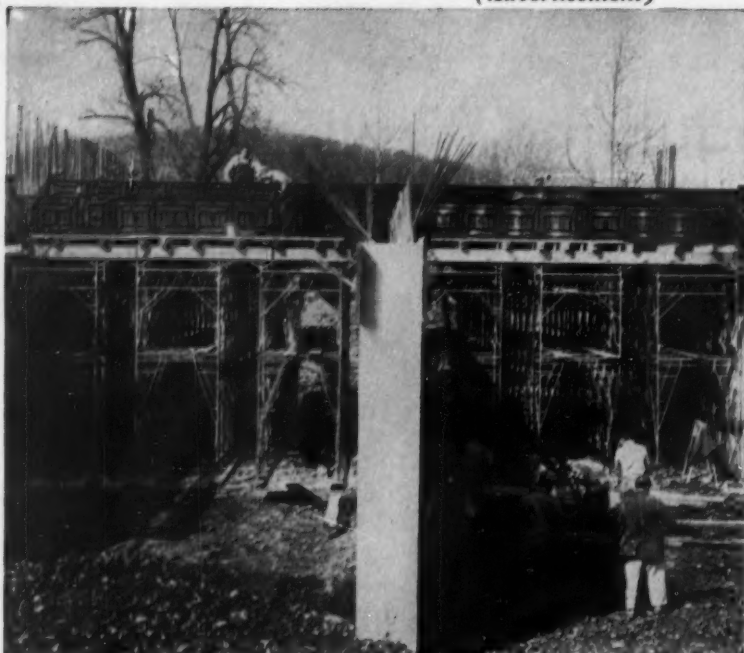
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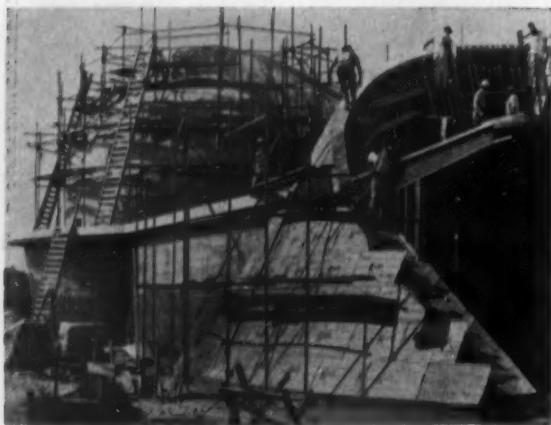


BRIDGE SHORING CUT 25% — Modern "Trouble Saver"® Steel Shoring helps contractor, Mal-Bros., save 25% in shoring costs, over wood methods, on a street relocation job in Scotch Plains, N.J. 272 frames with patented SlideLoks, quickly assembled in 3' x 5' towers and 2'6" between rows, provide support for the new roadbed. The contractor says his savings would have been 50% if the job were bigger.



LEVELING OFF — Masons for contractor John B. Kelly easily check level from safe, stable 28" wide "Gold Medal"® Twin Drum Scaffolds on the new 14-story Virginia State Office Bldg., Richmond.

Scaffolding Methods . . . by Patent Scaffolding Co.



ALL SURFACES — Plasterers for Travis and Rodgers, contractor, get everywhere quickly on these 40' by 36'-high odd-shaped domes from 2½ miles of "TubeLok"® Scaffolding. Cantilevering prevents the scaffolding from bearing at any point on this building in Disneyland near Los Angeles.



REFINERY JOB — "Trouble Saver" Sectional Steel Scaffolding is easily assembled to conform to round surfaces, such as this oil storage tank at the huge new Tidewater Oil Co. Delaware Flying-A Refinery near Wilmington. Workmen for C. F. Braun & Co., builder, are insulating the tank's exterior.

To help you with your scaffolding methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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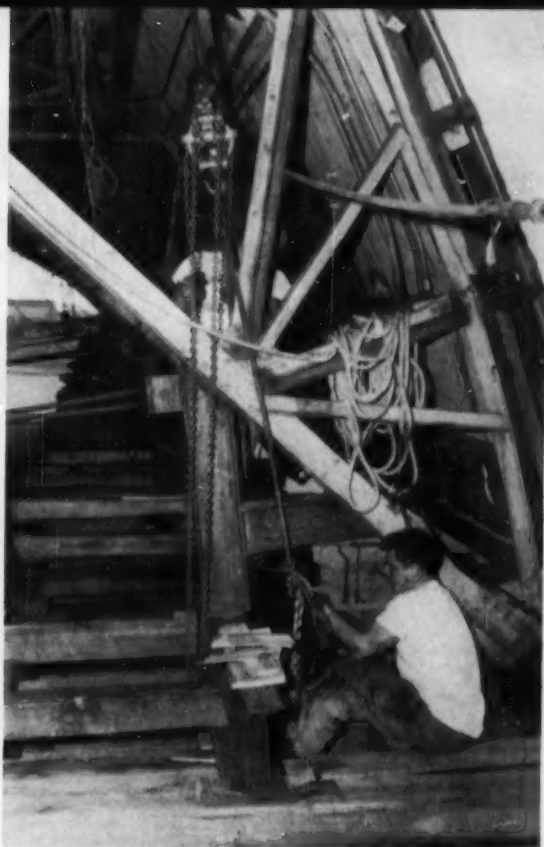


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RAILROAD TIES are hoisted atop cribbing by Gerlinger lift truck. Jacks are ready to be retracted and jumped for next lift.



CHAIN HOIST raises 100-ton Dudgeon jack under lifting bracket. Tie has just been placed underneath. Ram will be wedged tight.

TILTED HANGAR . . .

Continued from page 84

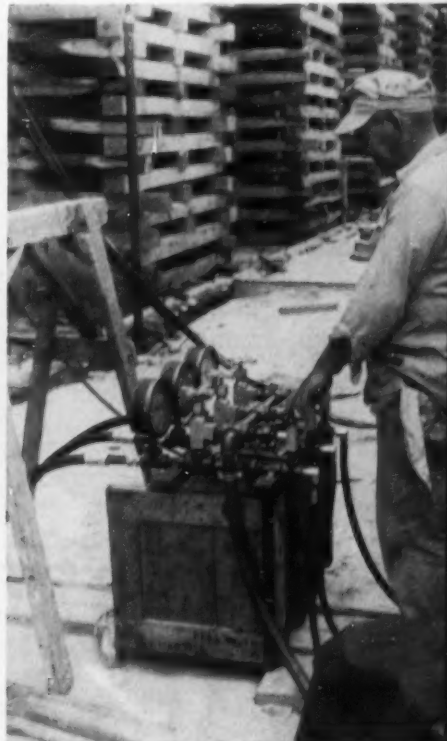
When the jacks extended 6 in., the operator closed a second set of three valves, locking the pressure in the lines and preventing jacks from retracting until a tier of railroad ties could be added to the cribbing. Meanwhile, hydraulic fluid was circulated from the pump, through a manifold at the valve control, and back to a reservoir. When the jacks were ready to be retracted, valves were opened, and the hangar load was transferred through the brackets to the cribbing. Jacks then were hoisted up 6 in. by chain hoists and ties pushed underneath.

Timber Structures Co. now is erecting a wood-frame maintenance structure along the tilted edge of the hangar to take the reaction from the trusses. Diagonal steel members will transmit the load back to the tie rods in the floor that held the arches together in their original position.

B. Samuels is project manager for New Jersey Erectors, Inc. Iorio Construction Co. is general contractor. The owner is Newark Air Service, Inc. Engineers Co., Inc., Newark, planned the project.



HYDRAULIC LINES carry fluid to three banks of jacks. When front valves are locked, fluid is recirculated from a 3-cylinder pump through valves and then reservoir.



REAR BANK of valves maintains uniform hydraulic pressure during lifting. Front bank locks pressure in lines when jacks are fully extended. Gages show line pressure.

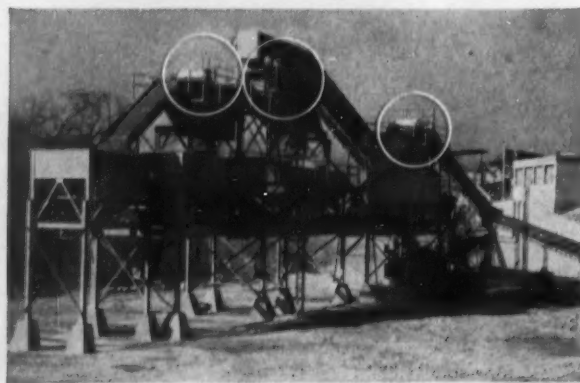
YOU GET MOST ACCURATE on new Highway Program Jobs with



Above are shown 11 Cedarapids Horizontal Vibrating Screens on the screening plant of Concrete Materials Plant at Maline, Kansas. Concrete Materials has 16 of these screens in this one plant to maintain a 1000 TPH production rate.

67 Cedarapids Screens used on Kansas Turnpike

When aggregate contractors on the Kansas Turnpike were required to produce big tonnages of rigidly specified aggregates from poor material, they turned to Cedarapids Horizontal Vibrating Screens. A total of 67 of these screens were used in portable and stationary equipment to scalp fines, classify material and grade finished products. These screens assure owners of accuracy and maximum capacity since screen cloth openings are all in a horizontal position and at a right angle to the fall of material so that all material that should go through the screen goes through.



Three Cedarapids 4' x 12' Horizontal Vibrating Screens handle 240 ton per hour output from a Double Impeller Impact Breaker, and produce six sizes of aggregate. The plant is owned by New Hope Crushed Gravel Co., New Hope, Pennsylvania.

The Cedarapids Line of Equipment Includes:

PORTABLE AND STATIONARY CRUSHING, SCREENING AND WASHING PLANTS FOR STONE, GRAVEL AND SAND • BELT CONVEYORS • VIBRATOR AND REVOLVING SCREENS • FEEDERS • HAMMERMILLS • DOUBLE IMPELLER IMPACT BREAKERS • BATCH TYPE AND CONTINUOUS TYPE BITUMINOUS MIXING PLANTS • DRIERS • DUST COLLECTORS • VIBRATING SOIL COMPACTION UNITS • MOTORIZED HEAD PULLEYS

Built by Iowa...Sold the World Over

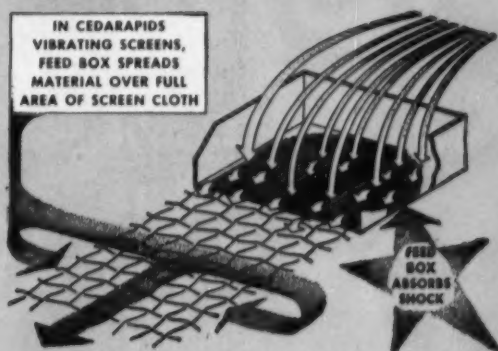
GRADATION FOR HIGH TYPE SPECS

Cedarapids Horizontal Vibrating Screens

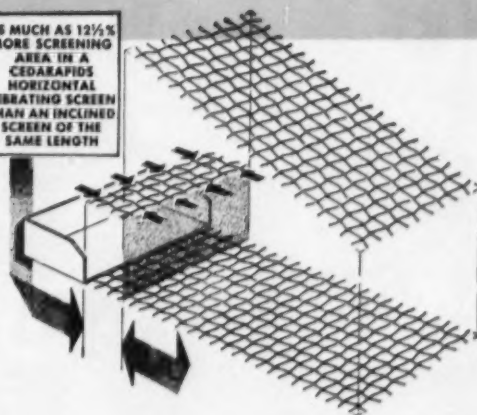
● Big volume production of aggregate that meets the high type specs of Turnpike and National Highway jobs requires the best in screening equipment. You can be sure of having the best when you depend on Cedarapids Horizontal Vibrating Screens. They are designed to give you 20% to 30% more efficient gradation since the horizontal position of the screen and almost vertical fall of material increases screening capacity because the full area of the screen cloth openings is available for material to pass through. Another advantage is that the horizontal position gives 12% more effective screening area than ordinary inclined screens of the same length. Flexibility of screen deck arrangements gives you accurate control of a variety of products. Your Cedarapids dealer can explain the many ways that these high production screens can be used in stationary or portable aggregate plants.



IN CEDARAPIDS VIBRATING SCREENS, FEED BOX SPREADS MATERIAL OVER FULL AREA OF SCREEN CLOTH



AS MUCH AS 12½% MORE SCREENING AREA IN A CEDARAPIDS HORIZONTAL VIBRATING SCREEN THAN AN INCLINED SCREEN OF THE SAME LENGTH



Cedarapids
Built by
IOWA

A big volume of oversize material comes off one Cedarapids Horizontal Vibrating Screen onto a second for further classification on Bero Construction Company's Washing and Screening Plant at Plattsburg, N. Y. This Cedarapids plant consists of a 60' x 10' Scrubber, two 48' x 12' Double Deck Screens, four 23 cu. yd. bin units and conveyors, all Cedarapids.



IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

Cast Iron Clip Clips Slab Costs of Apartment Project



FORMWORK for slabs goes into place at a two-floor-a-day clip on fourth building of Alfred Levitt's revolutionary 40-building housing development near Whitestone, N.Y.

THIS IS A STORY about how $7\frac{1}{2}\%$ saves \$400,000 on a \$20 million housing project.

- Hero of the story is a two-ounce cast iron clip used as a concrete slab form support.

- Scene of the rescue operation is Alfred Levitt's revolutionary housing development near Whitestone, N. Y. This is a group of forty, 8-story apartment houses measuring 61x82-ft that kick conventional apartment house design in the teeth.

- Time of the action is the present.

Alfred Levitt—brother of William Levitt, Jr., of New York and Pennsylvania Levittown fame—was in trouble. He was trying to do for multiple housing what his brother did for small dwellings. But things were going wrong.

One of the biggest cost-saving features of the job was the use of pre-cast concrete plank $2\frac{1}{2}$ -in. thick nailed over lightweight steel joists for floors throughout the project.

Concrete plank primarily is used for roof construction. But Levitt reasons it would prove a good, inexpensive way to build fireproof floors for his entire job. Plank costs only 55¢ psf to install. Its use requires the placing of an asphalt cement topping that adds an additional 20¢ psf to erection costs, bringing the total for the slabwork to 75¢ psf. Normal reinforced concrete slab construction runs upward from \$1.50 psf.

Use of the plank, however, did not go past three buildings. Slabs had to be loaded with cinder block for partitions and facade walls, and the planks tended to crack under the load. They also cracked while being nailed to the joists. This required costly patching and repairing. In addition, planks had a tendency to wobble when moving loads were passed over them. This happens despite heavy shimming and grouting of spaces between planks and joists.

Placing electrical conduit also upped costs. Conduit normally is imbedded in a concrete slab. With the use of plank, however, the conduit had to be laboriously passed through holes provided in the lightweight steel joists supporting the plank.

Resorts to K-System

Levitt turned—in an effort to correct these problems—to a poured concrete slab system. This was the K-system, developed by New York structural engineer Edward S.

Klausner, that permits installation of poured concrete slabs without the need for upright supports and features speedy erection and stripping of forms (CM&E, Oct. 1955, p. 58).

Key to the system is a cast-iron clip that weighs only two ounces and sells for about 7½¢. Levitt awarded a three-building test contract to Unit Frame & Floor Corp. of New York and Dunwell Concrete Construction Co. of Englewood, N. J., to install the lightweight joists and place K-system type concrete slabs.

How It Works

This is how a slab is installed. A bundle of lightweight 20-ft Stran-Steel joists is lifted by crane to the floor ready for a slab. The 12-in. joists are tack welded on 18-in. centers to the bottom flanges of the floor beams to keep them in place.

Workmen then fit the cast iron clips over the top flanges of the joists on 2-ft centers. Clips support pre-cut sheets of 5/8-in. plywood 8 ft long and 18 in. wide set between the top flanges of adjacent joists.

Over this plywood deck—strong enough to take all normal construction loads—goes a layer of 6x6-10/10 welded wire mesh followed by 2 in. of 2,500-psi concrete. A crane lifts concrete by bucket to a hopper set on a spandrel beam. The hopper dumps into hand operated, rubber-tired buggies, and workmen spread, screed, float, and hand trowel the concrete to the desired finish.

Stripping the forms is simple. From the under side, workmen have only to break off the exposed flange of the clip with a hammer, and the form panel falls free to the deck below.

Results of the three-building test of the system were: (1) Low slab installation costs (about 50¢ psf as compared to 75¢ psf for the plank); (2) Fast slab placing speed (a building a week); (3) Placing of conduit and other fixtures within the slab; (4) Slab rigidity.

"The system worked so well," said project manager Charles H. Eiben, also president of Dunwell, "that Levitt awarded us the contracts for the remaining buildings."

The award amounts to a real plum. With approximately 40,000 sq ft of deck per building, the contract will total some 1,600,000 sq ft of slab. Levitt will save approximately \$400,000 with the system.

(Continued on page 94)

Speedy Forming, Easy Stripping Are Money-Savers



PLYWOOD template helps to properly space Stran-Steel joist prior to slab forming.



JOISTS are welded to structural beams to prevent them from slipping off centers.



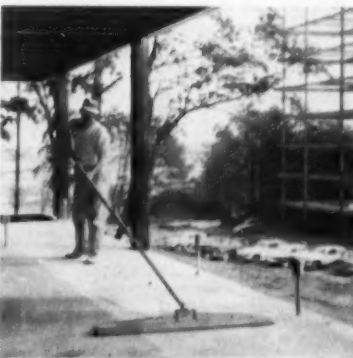
PRECUT plywood forms fit easily into cast iron clip previously placed on joist flange.



WORKMEN mop form oil over deck before reinforcing. This will speed later stripping.



WELDED WIRE MESH is rolled out over deck and nailed to joist prior to concreting.



LIGHTWEIGHT aluminum float, Dunwell's Tappan-Zee, has wide finishing range.



FORMS are stripped simply by breaking off clip flange, allowing form to fall free.



NEW SUPER MILEAGE LUG TIRE CUTS YOUR HAULING COSTS

PULLS BETTER OFF ROAD, TOO!

Here is a new Firestone tire that will cut your operating costs to the barest minimum.

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Firestone Super Mileage Lug tires have 60% deeper tread to give you more low-cost miles. More than that—they are built with husky, Safety-Tensioned Gum-Dipped® cord bodies. This exclusive Firestone process gives a stronger tire body and makes it possible to get more retreads on every tire.

Any way you look at it, you'll save money with Firestone Super Mileage Lug tires! If you operate dump trucks, cement mixers, logging, mining or any other heavy-duty trucks, it will pay you to contact your Firestone Dealer or your Firestone Store now for the best deal you ever got on the longest wearing, most dependable tire ever built for on- and off-the-road performance!

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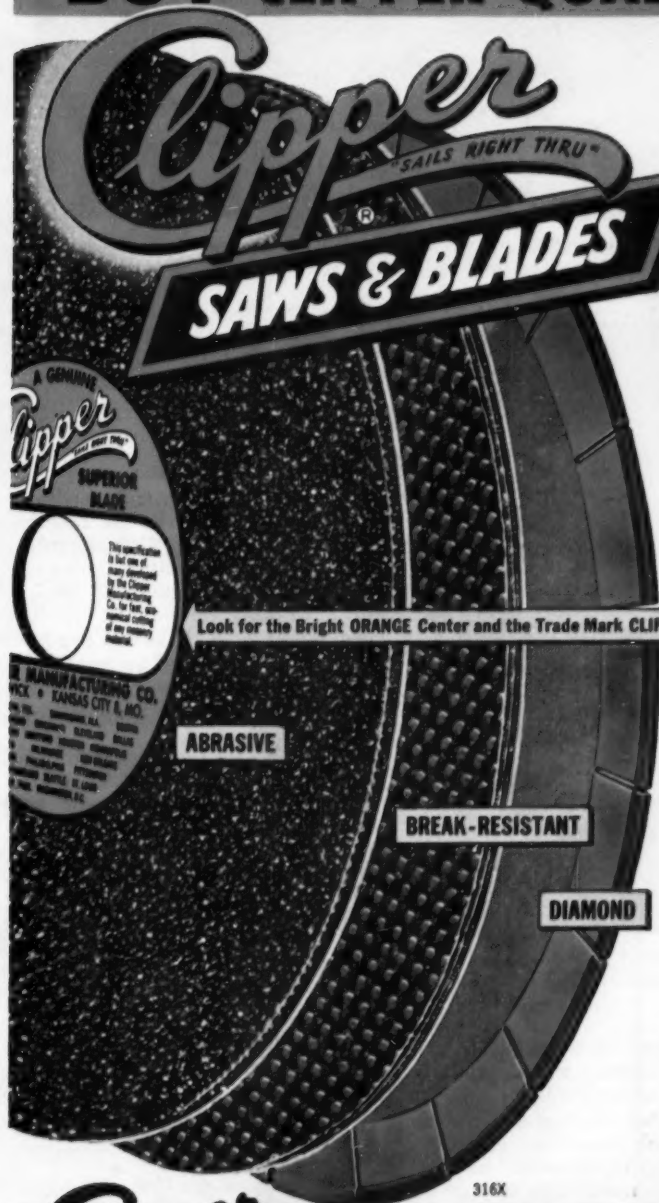
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DIAMOND—Clipper sells more because Clipper sells Quality. Blade after blade on tile to block, Clipper Diamond blades outperform, outcut and outlast any other blade. Dependable... consistent quality. IF YOU DON'T KNOW DIAMONDS, KNOW YOUR MANUFACTURER!



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"Let the Pioneer Beware..."

SERVING UP new ways of doing jobs and trimming costs down to the bone are specialties of the Levitts. But pioneer Alfred Levitt on his multiple housing experiment isn't entirely satisfied with the results.

"The industry is not ready for these new techniques," Levitt moans. "Though costs figure out nicely on paper, there is the human element to contend with."

Levitt feels that builders who try to depart from accepted construction methods sometimes take a long chance. He claims that subcontractors do not keep up with the times.

"The times," he says, "require new techniques, new methods to come out ahead in the competitive struggle. But subcontractors are in a rut. They do things the way they have been done for years. This leads to a basic failing—pricing by unit costs. Everything they do they figure by so much a square foot, so much a ton, or a hundred bricks."

Levitt cites steel erectors as an example.

"They are used to figuring so much a ton for steel in place. Most buildings use heavy wide flange steel. My buildings have no need, design-wise, for heavy steel so I don't use it. I have a good reason. I want to save money."

"The steel erectors tell me they cannot make money at their per-ton erection price. I tell them that the lighter weight will offset the reduction in tonnage with speed of erection. They say, no. They want more money. There's a building boom on. Subcontractors are independent. They're not hungry so they can demand what they want and get it. I sign a contract paying them more money per ton than I should."

"Two weeks later it turns out that the lightweight steel is easier to erect and that I was right about the price. So the steel erectors make more money than they figured on, and I end up paying more than I figured. Its the same with the others."

Levitt's concern with having to spend more money for his project than his cost sheets showed, due to old-fashioned contractor thinking, may be valid. But even the addi-



FOUNDATIONS are just simple, poured concrete piers that will support the eight stories of structural steel. Eliminating the basement saves about \$9,000 per building.



SUPERINTENDENT John Golden checks out plumbing placed before steel erection.

tional money spent is a far cry from the several million dollars more the buildings would have cost had they been planned along more conventional lines.

"Sure they're different," he said. "It took us more than a year to comply with the building code alone."

Here's how some of the other savings will accrue.

\$350,000 Saved On Basements

Normally an apartment house this size would get a full basement. Levitt substitutes simple concrete piers to support structural steel. For a 61x82-ft foundation 12 ft deep, Levitt would have had to pay for about 2,222 yd of excavation. This would have cost him about \$1.25 a yd or \$2,778 for each building.

Excavating for the piers requires the removal of only about 50 yd of material (apart from grading). This brings the cost down to about \$200 per building or \$8,000 for the project, a saving over the whole job of about \$102,000.

Putting in a basement would have cost Levitt about \$6,650 per basement. This is based on the use of 12-ft walls and 2-ft footings, or approximately 5,320 cu ft of concrete at \$1.25 per ft. Piers will cost only about \$400 per building, a saving per unit of \$6,202 or \$248,000 for the over-all project.

(Continued on page 98)

**EXTRA VALUE...
EXTRA PERFORMANCE**

IN A 1/2-YD. MACHINE!

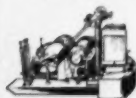
THE LORAIN 15



EXTRA HOE VALUES! — Buckets from 24" to 40" (3/4 yd.) — 2 Boom lengths — 14' and 16'.

Though nominally rated as a 1/2-yd. machine, the extra weight, strength and stability of the Lorain-15 enable it to match the productive capacity of many higher rated, more costly machines. As a shovel, hoe or dragline, it can do those *extra-size* jobs... with long life... freedom from operating delays... at greater profit to you. The Lorain-15 proves these points... if you will check the brief listing of features below and then check with your Thew-Lorain Distributor, you will see what we mean by "extra values." You make the comparison—then decide!

BIG-TIME FEATURES in the 1/2-yd. L-15



**TURNTABLE
FEATURES**



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**BOOM
FEATURES**

- 5 identical interchangeable shoe clutches • One-piece, all-welded, truss-reinforced, rigid turntable bed
- 19 anti-friction bearings on power shafts and clutch drums alone • Oil-enclosed cut gears • "E-Z" operating controls—effortless action; fast response; longer clutch life • "Hydra-Ease" power control of crawler steering, tread lock, house lock, and shifting of swing-travel jaw clutches.
- 16" cast-steel tread shoes—22" & 29" available • Oil-enclosed crawler travel mechanism • 4-way position tread and travel lock, hydraulically powered and operated • Replaceable tread pin bushings available.
- Usable as shovel, crane, clamshell, dragline, hoe
- Crane boom of square-tubular-chord design; minimum weight, maximum capacity and reach • Power load lowering standard • Ability to "back-down-the-load"
- Precision boom lowering device for cranes • Independent crawler travel available—a big help in drag and hoe operations. Permits simultaneous hoist, swing and travel.

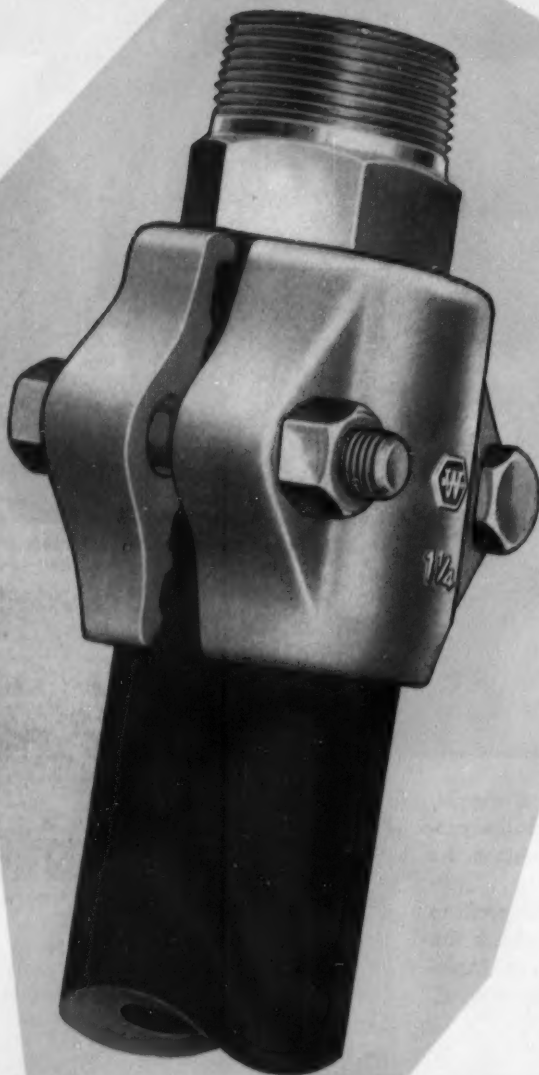


EXTRA CRANE BOOM VALUES! — For dragline, clamshell and lifting service feature new square-tubular-chord boom that permits maximum lifting capacities, greater digging ranges.

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THEW LORAIN

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Requires no hose-skiving or special tools. Cadmium-plated malleable iron to resist corrosion. It's reusable! Sizes: $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ " and 2". Immediate delivery from your Weatherhead Distributor.



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Dash Controls



Brass



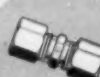
Drain and Shutoff Cocks



SAE Flare-Twin (JIC)



Ermeto®



Selfalign®



Bulk Hose and Reusable Hose Ends



Hose Assemblies



Tacoma City Light Photo

NEW DAM UNDER WAY IN LAND OF LEWIS AND CLARK — Shown high above the Cowlitz River, near Mayfield, Wash., these workmen are making blast holes with 1-in. hexagon and 1½-in. round Bethlehem Hollow Drill Steel, to prepare the cliff face for construction of an abutment for Tacoma City Light's Mayfield Dam. The concrete-arch dam is part of a \$138,100,000 hydroelectric project for City of Tacoma. It will have gravity wings and thrust blocks, and upon completion will be 185 ft high and 850 ft long. Its spillway section will be 205 ft wide.

Contractors: Arundel Corporation and L. E. Dixon Co. Tunnel subcontractor: Gibson & Roberts, Inc. Drill steel reconditioning: Senter Tool Service.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

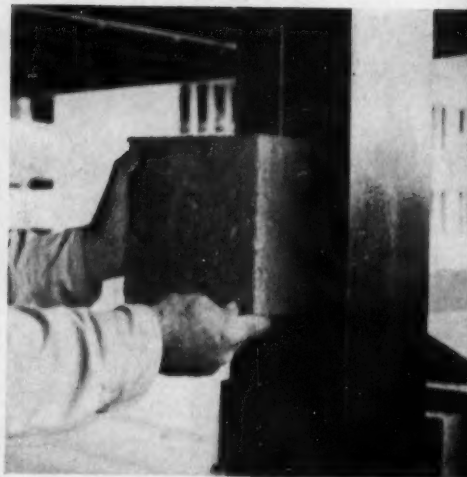
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL





MASONRY work represents one of the biggest savings on the job. Levitt completely eliminated face brick and, as a result, is saving about \$23,000 per building.



SPECIALLY cast cinder blocks that fit around columns help cut fireproofing costs.

\$920,000 Saved On Masonry

Masonry represents by far the biggest cost cut over conventional apartment house construction. Normally, facades of these buildings are built of back up block faced with brick. With about 23,000 sq ft of facade in each building, this part of the job would have cost—at about \$2.00 psf—all of \$46,000 per building. Levitt simply eliminated the brickwork. His walls are of cinder block construction which at a cost of about \$1.00 psf to erect represents a saving per building of about \$23,000.

Other techniques, designed to cut costs, fall into the category of "subcontractors having to grow into new methods," according to Levitt. One such technique was placing plumbing lines into the ground during the foundation work, testing, and covering them before the start of structural steel erection.

"But the job has created textbook interest for builders around the country," says Levitt. "They constantly visit the job, and maybe later they'll take advantage of these ideas."

Asked if he intended to try another like project, Levitt replied: "Ask me again next year!"

FINISHED BUILDING is totally fireproof and pleasing to the eye despite many economies.

NEW !

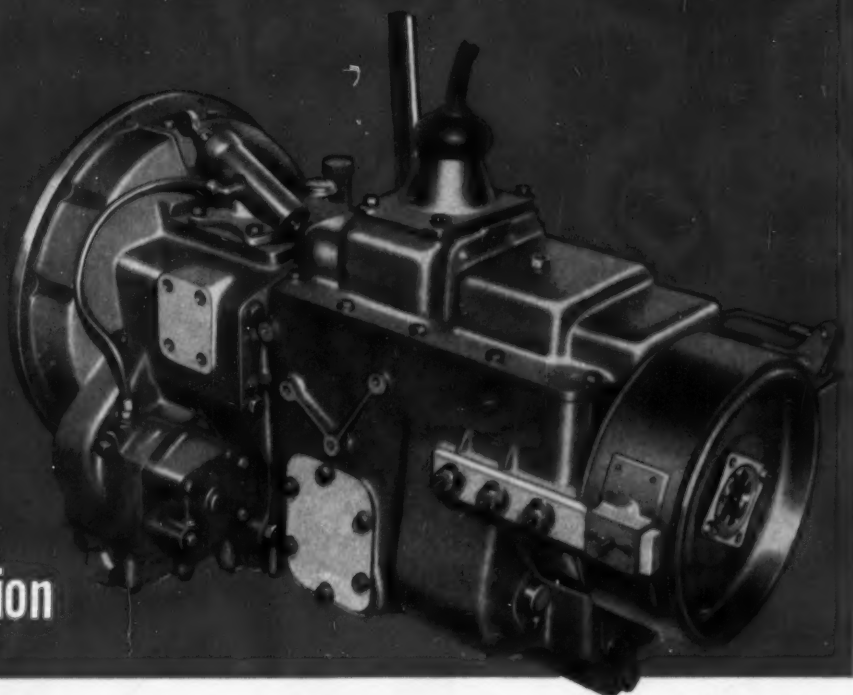
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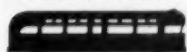
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means...
air-cooling!*



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our units increase power up to 100% depending on design and application of your engine, cut fuel costs, reduce noise and decrease or eliminate smoking. The removable rotating assembly

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We invite your inquiry on how you can improve the performance of your diesels by the application of our turbochargers.

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MODEL	T-10	T-14	T-15	T-30-2	T-30-6
Diameter — in. nom.	9	11.5	15.25	15.25	16
Length — in.	9	14.12	16.75	17.25	21.75
Weight — lb.	40	95	125	135	195
Output — lb/min. (Standard Conditions)	25-40	35-65	35-65	70-95	115-175

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RECENTLY DEDICATED, International's "Melrose Tech" offers factory training to contractors' and distributors' personnel.



...or on the road

WELL-EQUIPPED "Mobile Training Units" take LeTourneau-Westinghouse service training to locations convenient to contractors.

Training Opportunities Now Better Than Ever

SERVICE TRAINING SCHOOLS, now better planned and better executed than ever before, give the contractor his best chance to fa-

miliarize his personnel with the intricacies of today's powerful earthmoving equipment.

The equipment manufacturing

industry is spending more than \$1 million this year to help train distributor and contractor personnel, and it will spend still more next year.

The industry's renewed emphasis on training was explained recently by Harald T. Reishus, vice president of International Harvester's construction equipment division: "International's manufacturing facilities are dedicated toward the building of a quality product . . . however, we must admit that most products offered in our field today are also quality products. It is obvious that a customer's buying preference is affected by the quality of service that he can expect from the various competitive manufacturers and their sales organizations. Service is now the most important single factor in the retail level of our business."

Reishus made these remarks as he dedicated an elaborate, up-to-the-minute service training center at International's Melrose Park, Ill., plant. Facilities at the school, called Melrose Tech, cover more than 5,000 sq ft of floor space. They include an auditorium for showing slides and movies, classrooms with machine cutaways, shop areas for tearing down and assembling equipment, well-equipped tool rooms, and laboratories for studying components such as torque converters and injection pumps.

Personnel from contractors' and distributors' organizations come from all over the country to take the one-week course, which offers 49 hr of instruction in preventative maintenance, trouble shooting, and repair of all types of International equipment.

When a student finishes his course he takes back with him a presentation that International calls a do-it-yourself kit, consisting of visual aids and text books. With this material the student can pass on what he has learned to others in his organization.

Mobile Training Centers

If the contractor or distributor will not go to the factory, the factory will come to him. Manufacturers are spending considerable sums to fit out what they call mobile training centers. These centers, usually housed in specially-designed tractor-trailers, offer specialized courses at the local distributor's shop or at the contractor's yard.

(Continued on next page)

SERVICE TRAINING SCHOOLS... continued

LeTourneau - Westinghouse has two fully-equipped mobile training centers touring the country. To date, they have logged better than 200,000 mi and held more than 140 schools, including schools in Mexico, Canada, and Cuba. The company invested close to \$100,000 to outfit the trailers and staffed them with 10 full-time instructors with a combined total of 146 yr of earthmoving experience.

One of the trailers, on the road since 1950, offers instruction covering LeTourneau - Westinghouse equipment, and the other specializes in Adams equipment. To date, the centers have trained more than 4,000 men at locations near their own yards. Attendance averages five distributor mechanics and 24 contractor mechanics per course.

At the four-day service school, theory is discarded in favor of practical training. When the school is held at a distributor's shop, his machines become props and they are disassembled and assembled by the students and instructors from the radiator through the final drives. The mobile center also carries a set of detailed cutaways of component parts.

Several specialized subjects are covered, including a detailed analysis of the electrical system, an important component of LeTourneau - Westinghouse equipment. Using visual training aids, the complete electrical system is revealed in a manner that the average mechanic can understand easily. Each individual unit of the system is discussed as to its purpose, construction, function, and characteristics.

LeTourneau - Westinghouse also operates extensive training facilities at its Peoria, Ill., factory school. At this school the students are predominantly distributor and export division personnel, but contractors' mechanics are always welcomed. The course on LeTourneau - Westinghouse equipment, again with special emphasis placed on the electrical system, lasts two weeks with the time about equally divided between classroom and shop work.

A course devoted entirely to instruction on the working principles, operation, trouble shooting, and repair of General Motors series 51 and 71 diesel engines—used extensively in LeTourneau - Westinghouse equipment—lasts ten days. Four labs and a large shop area are set aside for this

school. Each student receives individual instruction because enrollment is restricted to six students per class.

During 1955, when LeTourneau - Westinghouse acquired the Adams line, a one-week course on graders and Traveloaders was initiated. Courses covering LeRoi engines, air tools, and allied products are also available.

'Cat Care' Program

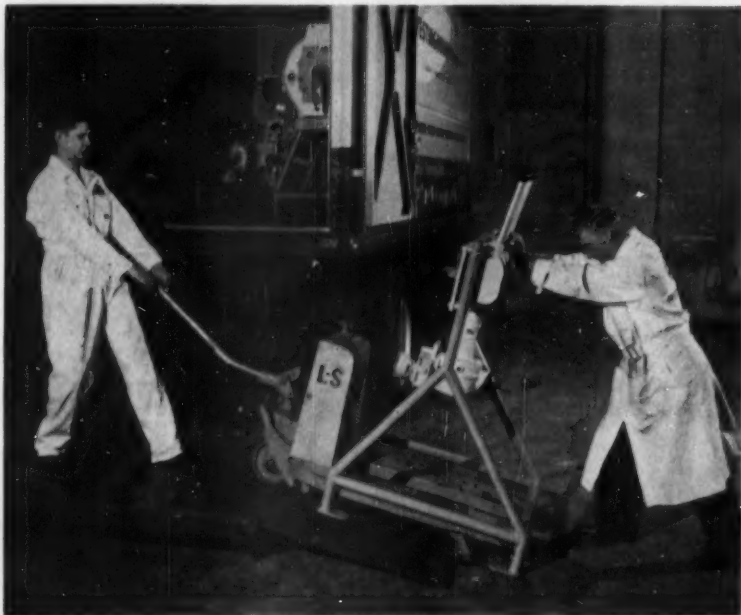
Caterpillar has concentrated its training efforts at the distributor level, although it also offers factory training. The "Cat Care" program of preventative maintenance

schools, held by distributors at their shops or at the contractor's yard, have proved popular. These schools are staffed by distributor personnel who, in most cases, have been trained at the Caterpillar factory. They follow a curriculum worked out by Caterpillar service engineers, but they can tackle maintenance problems peculiar to a particular location because they are familiar with the area. Cutaways, movies, charts, and other training aids are supplied by Caterpillar.

Like most manufacturers' training schools, Cat courses are designed to give specific information




EUCLID uses three General Motors Corp. training centers located at Denver, Atlanta, and San Leandro, Cal., to provide factory-like training for contractors in those areas.



CUTAWAY of Adams motor grader controls is loaded on specially designed truck at close of four-day service school. LeTourneau-Westinghouse units have logged 200,000 mi.

SAFETY



BY THE MILE

...because white concrete reflecting curb points the way

Highly visible, day or night, wet or dry, this glistening white concrete ribbon stretches as far as the eyes — or headlights — can see. Curbs and slopes show up in ample time — much quicker to find and easier to see than any readable sign. Even in pouring rain, the wet saw-tooth surfaces of this white curb reflect headlight rays back to the driver when his need for guidance is greatest. Knowing the added safety — through added visibility — designers and builders are installing white concrete curbs — made with Atlas White Portland Cement — as standard equipment on the highways of

today and tomorrow. What's more, no modern highway should be without them. Write for further information on how Atlas White Cements are contributing to highway safety.

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UNITED STATES STEEL  CORPORATION SUBSIDIARY

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Atlas® White Cement

FOR CONCRETE REFLECTING CURBS AND MARKERS

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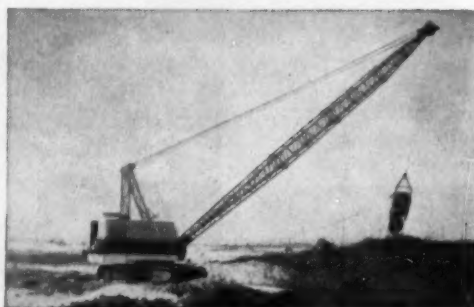


You need plenty on the ball to be a big league champ—and plenty more up your sleeve. Everything depends on the man!

In shovels, it's different. Marion machines can make every operator look like a champ. Built-in qualities make it easy to deliver fast cycles and big daily output.

Why not give your operators the best chance to be champs all season long?

Marion Means Business



MARION 101-M • 3 Yard Shovel • 54 Ton Crane

MARION POWER SHOVEL COMPANY, MARION, OHIO



"CAT CARE" preventative maintenance school, held in shop of Shepherd Machinery Co., Los Angeles Caterpillar distributor, draws majority of Cat equipment users in the area.

on specialized subjects. Among these are tractor and grader preventative maintenance, diesel engine maintenance, the care of air, oil, and fuel filters, and the operation of specialized power attachments. A popular feature has been the showing of Caterpillar's safety films, which have won numerous awards over the years.

Typical of "Cat Care" schools are the two held last year by the MacAllister Machinery Co., Indiana distributor for Caterpillar equipment, for contractors working on the Indiana Turnpike. To make it as convenient as possible for the contractors, schools were held at Michigan City and at South Bend. The two schools, which stressed preventative maintenance and operator safety, were attended by over 150 supervisors, mechanics, and operators. They were of great value to the contractors because the distributor was completely familiar with working conditions in the area.

Two of the construction companies attending the school, Arcole-Midwest and S. J. Groves, requested additional training at their own yards on the oil clutch and torque converter. MacAllister obliged.

Another program of interest was held recently by a Caterpillar distributor at the request of an operating engineers local. The school on preventative maintenance was given as part of a regular union meeting, and it was well-attended by the membership.

Equipment Applications

Allis-Chalmers, in addition to offering maintenance training, also stresses job planning and equip-

ment application. At its Springfield, Ill., Industrial Training Center, 200 acres of undeveloped land are used exclusively for training under actual job conditions. Two-week classes are held for distributor and contractor personnel. Half of this period is spent in the classroom where full-scale cutaways of tractors and motor graders and their component parts are studied. The remainder of the course is devoted to field work where students are given the opportunity to supplement their knowledge of earthmoving by planning and staking out various earthmoving projects, and by performing maintenance operations under working conditions.

Allis-Chalmers stresses the importance of adequately-trained

salesmen and service personnel to its distributor organization. All of its distributors are encouraged to send new personnel to the Springfield center and also to send their experienced men for refresher courses from time to time. This provides, according to Allis-Chalmers, a nucleus of men in the field who can relay this training to their customers. Not only can they tell them how to get good service from their rigs, but they are also experts on equipment applications and job methods.

This idea is shared by many manufacturers. Almost all of them hold schools for their dealers, and an effort is made to train as many men as possible. Some firms, such as Eimco, Worthington, and Ingersoll-Rand, to name but a few, give extensive training to service engineers who then circulate throughout the country as troubleshooters for their organizations.

Still another type of training is available from Euclid, which is in a position to take advantage of the facilities of General Motors Corp., the parent company. GM has established 30 permanent training centers around the country to train men from its automotive divisions. At three of these schools—Atlanta, Denver, and San Leandro, Calif.—extra facilities have been added to provide training at certain times of the year for Euclid's customers.

These centers, according to J. P. Neppel, Euclid's supervisor of

(Continued on page 109)



VISUAL AIDS, such as cutaway of power-train (above) enable average mechanics to grasp the complexities of modern equipment. Well-trained instructors also are important.

**Nylon cord tires reduced
off-the-road tire failures...**



NOW NYLON CUTS TRUCK TIRE COSTS, TOO



VIC ZEMAN

Vic Zeman Construction

Maribel, Wisconsin, reports:

"Nylon cord is the best improvement in tires since I came into the road contracting business twenty years ago. I wouldn't be without nylon cord tires for my trucks

and off-the-road equipment. They last half again as long as other kinds. They stand up much better under the strain of heavy loads, steep grades, and rough road surfaces.

"With savings on tire replacements and delays, and

with the extra recaps possible with nylon cord tires, I figure my long-run savings at 50% of standard tire costs."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON for TIRE CORD

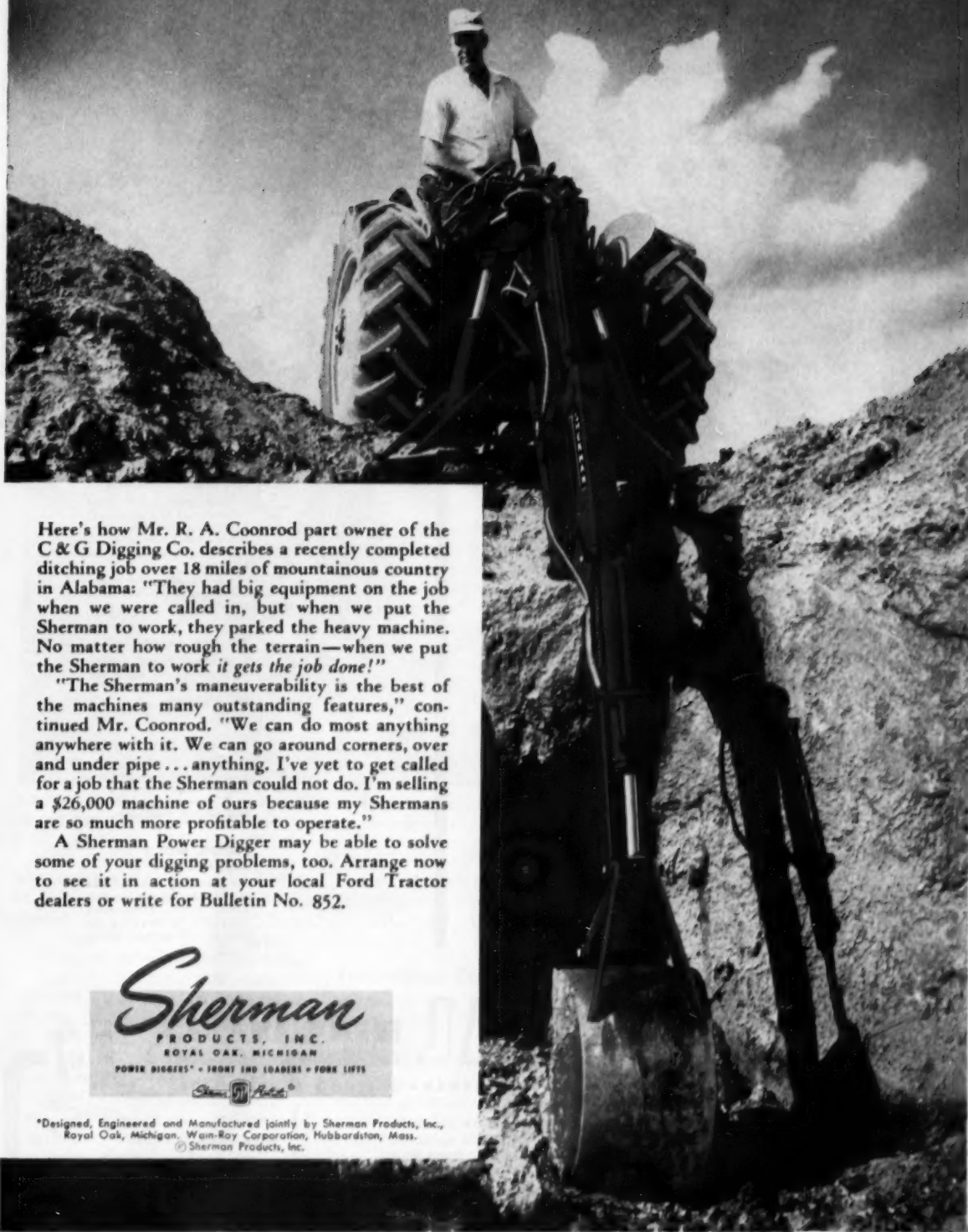


BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY



NOW . . . IN PASSENGER-CAR TIRES, TOO . . . THE STRENGTH OF NYLON . . .
FOR UTMOST SAFETY . . . SUREST PROTECTION AGAINST TIRE TROUBLE

Sherman Power Digger Replaces \$26,000 Machine



Here's how Mr. R. A. Coonrod part owner of the C & G Digging Co. describes a recently completed ditching job over 18 miles of mountainous country in Alabama: "They had big equipment on the job when we were called in, but when we put the Sherman to work, they parked the heavy machine. No matter how rough the terrain—when we put the Sherman to work *it gets the job done!*"

"The Sherman's maneuverability is the best of the machines many outstanding features," continued Mr. Coonrod. "We can do most anything anywhere with it. We can go around corners, over and under pipe . . . anything. I've yet to get called for a job that the Sherman could not do. I'm selling a \$26,000 machine of ours because my Shermans are so much more profitable to operate."

A Sherman Power Digger may be able to solve some of your digging problems, too. Arrange now to see it in action at your local Ford Tractor dealers or write for Bulletin No. 852.

Sherman

PRODUCTS, INC.
ROYAL OAK, MICHIGAN

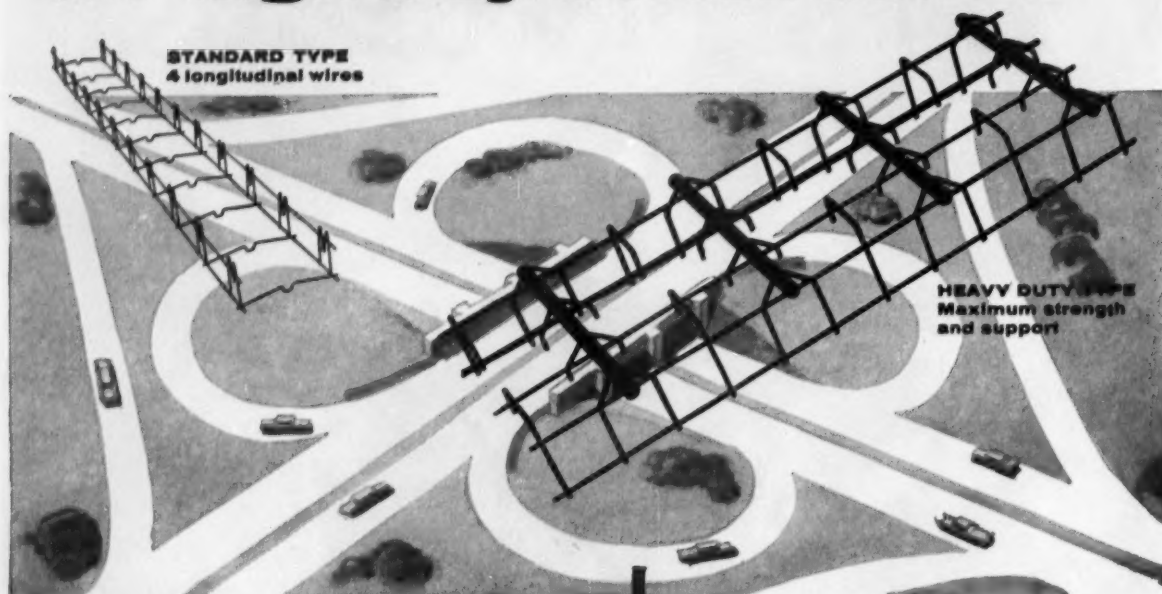
POWER DIGGERS • FRONT END LOADERS • FORK LIFTS



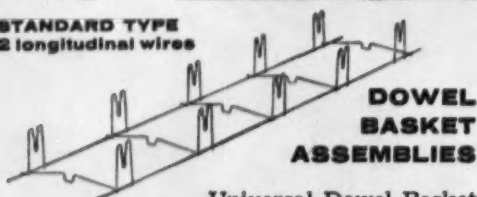
*Designed, Engineered and Manufactured jointly by Sherman Products, Inc.,
Royal Oak, Michigan. Wain-Ray Corporation, Hubbardston, Mass.

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UNIVERSAL PRODUCTS for highway construction



STANDARD TYPE
2 longitudinal wires



Universal Dowel Basket Assemblies are designed and fabricated to specifications. Special equipment and fixtures guarantee accurate spacing and positive alignment of dowels. High speed production equipment and modern facilities insure prompt delivery of your requirements. Universal Baskets are approved by Federal, State and private authorities for highway and airport construction.

Let us quote on your requirements. Write for complete details today.



INDIVIDUAL DOWEL CHAIRS

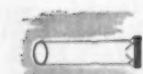
Two-legged dowel chair holds dowel in 2 positions. Easily pushed into sub-grade—won't turn after installation. Wide range of heights.

Single Leg Dowel Chair permits quick snap-in of Dowel. Sizes to support Dowel from 3" to 6" above sub-grade.



STAKE PINS

Keep Dowel Bar Assemblies in place during the pour. Lengths from 4" to 15" in 1/4" increments.



DOWEL SLEEVES

Metal Dowel Sleeves for covering 3/4" Dowel Bars; overall length covers 2 1/2" or 3" Dowel. Special sizes and lengths available.



HOOK BOLT ASSEMBLY

For providing required tying element along longitudinal joint. Eliminates necessity of bending the bars or drilling road forms.

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DISTRIBUTORS IN PRINCIPAL CITIES

Service
Wherever

You Build... Coast to Coast



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CUMMINS' new "Mobile Diesel Center," which will train 10,000 service personnel in next 12 months, lowers to ground on built-in jacks. Sides open to reveal stage, exhibits.



DIESEL CENTER carries its own lights, props, chairs, public address system, training aids. School (above) takes only 1 min to set up "anywhere we can take a truck."

service training, "provide factory training in an atmosphere designed for such training, at a location that is close to our dealers' and customers' places of business."

Training at these centers complements the year-around classes offered at Euclid's factory school at Cleveland. These courses, of one or two-weeks duration, are broken down to provide training on a specific type of equipment. A two-week course on all models of Euclid rear dumps is available, for example. Or a student can take a course covering just one rear dump model. One-week courses are held for such specialties as

hydraulics, steering and electrical systems, clutches, Torqmatic converters, and lubrication procedures.

Tailor-Made Courses

Earlier this year, the Codell Construction Co. of Winchester, Ky., sent 17 of its mechanics and supervisory personnel to the Cleveland factory school for a special program. Euclid, and most other manufacturers, welcome such opportunities. "With a group of this size, we were able to plan a special curriculum designed to meet Codell's specific needs," Nepel said.

Euclid is concentrating now on what it calls "on-the-job" training programs. As far as Euclid is concerned, this type of training, which brings exhibits and instructors right to the contractor's job, has been rather limited. But Nepel foresees a major program of this type that "will become a phase of training almost equal in importance to the factory school and our training centers." These classes are tailored to meet a contractor's specific needs. They vary in scope from a one-day preventive maintenance program to a week-long program on a variety of subjects.

Another training aid that has proved valuable is a series of films that Euclid has produced to show the proper applications, operation, and maintenance of a particular machine. These films are made available to local distributors, contractors' associations, or individual contractors. They can be obtained through local distributors.

The recently introduced Cummins Mobile Diesel Center is representative of manufacturers' efforts to bring good training facilities directly to the contractor. The diesel center is a specially-designed unit with its own stage, lights, props, chairs, cutaways, public address system, and electrical power. "Wherever the truck can be driven, we can take the mobile diesel center and hold a service program," says H. E. Bollwinkel, executive service manager. "We realize the importance of taking the factory to the field. And we expect this, the first of our mobile units, to contact approximately 10,000 service personnel within the next 12 months."

Four Types Of Training

Manufacturers' training programs are taking four basic forms—factory training schools, mobile training courses, courses handled by the distributor with material supplied by the manufacturer, and the do-it-yourself type of training that uses visual aids and texts prepared by the manufacturer.

The type of training offered by manufacturers, the availability of such training in specific parts of the country, and even its day-to-day scheduling depend on contractors' needs and demands.

LeTourneau - Westinghouse, for instance, following the desires of its customers, schedules its mobile units so that they generally work

SERVICE TRAINING SCHOOLS ... continued

in the North during the winter when contractors are having their off season, and in the South during the rainy season when weather figures to hamper a contractor's activity. This way, contractors can send their personnel to school without losing an excess of man-hours from the job. Most manufacturers follow this general rule when scheduling the classes.

It should be pointed out that in most cases the schools offered by manufacturers are aimed at the experienced journeyman mechanic and supervisor—not at the beginner. The classes are not indoctrination courses; they are designed to give advanced instruction to experienced men to help them keep abreast of new developments in the industry.

Except for the time away from the job, the mobile training centers and the distributors' schools cost a contractor nothing. Tools, texts, and even work clothes usually are supplied.

At the factory schools, the contractor pays only for his employee's transportation and hotel. Factory training courses are probably

still the most valuable because of the abundance of training material and the availability of specialists as instructors. Enrollment is usually restricted to a handful of students at a time—averaging about eight men per class—so that students receive what amounts to individual attention.

The major drawback, as far as factory schools are concerned, is the reluctance of some contractors to send men long distances to the factory for a school that sometimes takes two weeks or longer to complete. Manufacturers are attempting to dissolve this resistance by sending students back to their organizations with detailed presentations that include visual aids and easily-understood texts. With these presentations, students can pass on to other workers what they have learned at the factory.

The need for "taking the factory" to the contractor has been made clear to manufacturers, and they are slanting their efforts to improve their mobile training units. The schools that they send out on the road now do not carry only sales kits and a few charts


or cutaways. They are well-planned, well-equipped training facilities staffed with capable, experienced instructors—and their main purpose is to inform, not to sell.

One of the bigger construction outfits, Morrison-Knudsen Co., Inc., of Boise, Idaho, has taken wholesale advantage of the training opportunities available by instituting an eight-week course for 18 of its top-level supervisory maintenance personnel (CM&E, July, 1956). Specialists from 11 equipment and oil companies were only too glad to go to Boise and act as instructors, and to take their training aids with them.

From the contractor's point of view, this is the era of "extras," made available to him by manufacturers as part of their selling programs. The manufacturer's renewed interest in better, more accessible training facilities for its customers is one of these "extras."

The contractor who fails to take advantage of these services is missing a good bet. Well-trained mechanics, as any contractor knows, are hard to find.

These pumps turn "tough" jobs into "PROFIT" jobs!



FROM 1" TO 10"

CMC DUAL PRIMERS

- Dual Volutes
- Self Cleaning Case
- Lighter Weight
- Long Life Seal
- Half the Parts
- Unitized Construction

Contractors "in the know" insist on CMC Dual Primers! They've learned from on-the-job experience that they can rely on the exclusive features of these pumpers to give **FASTER DUAL PRIMING — MORE DEPENDABLE OPERATION — LONGER LIFE WITH LESS MAINTENANCE.** Get full details today.

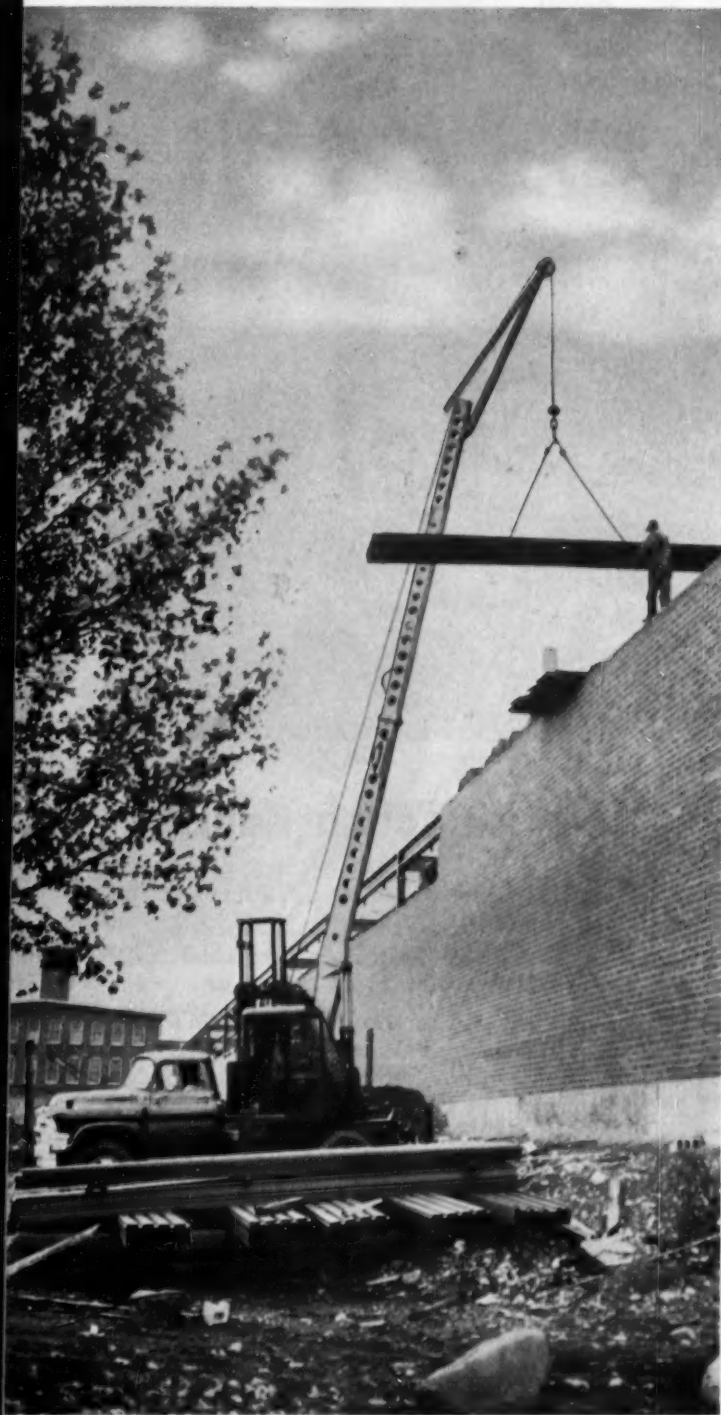
CONSTRUCTION MACHINERY COMPANY, Waterloo, Iowa



Capacities to 240,000 G.P.H.

Also a complete line of 3" and 4" Diaphragm Pumps, gasoline engine and electric motor models. 1 and 2-stage Hi-Pressure Pumps. **WRITE FOR FREE LITERATURE.**

Bucyrus-Erie Announces New 5-Ton Model H-3 Hydrocrane 10,000-lb. maximum capacity, 3/8-yd. clamshell



Bucyrus-Erie Hydrocranes have long been noted for big lifting capacity per pound of crane weight. Now the new Model H-3 Hydrocrane—mounted on a lightweight, low-cost truck—gives you 10,000-lb. maximum lifting capacity. And the new Model H-3 retains short tail swing characteristics that have made Hydrocranes standouts on close-quarter work.

In addition, this all-hydraulic, multi-job speedster has many more outstanding new features that put it even farther ahead of ordinary truck cranes.

NEW LOAD INDICATOR WEIGHS EACH LOAD YOU LIFT

A new outstanding safety feature is the load indicator and pressure gauge located at the operator's station. He knows at a glance if the load can be safely lifted at the required radius.

AUTOMATIC OUTRIGGER LEG LOCKS ELIMINATE DOWN DRIFT

Vertical outrigger legs have spring-actuated catches which operate automatically to eliminate outrigger down drift during travel. No chains or snap hooks are needed.

NEW HOUR METER CLOCKS ENGINE WORK HOURS

Better care results from the recording of actual hours of operation . . . makes it easy for the service man to follow recommended protective maintenance program.

NEW IMPROVED THROTTLE CONTROL FOR SMOOTHER OPERATION

Vibration-proof locking throttle control, conveniently located at operator's finger-tips, permits him to set and hold engine at desired speed.

NEW TRUCK BRAKE LOCK

"Mico" electric brake lock holds truck wheels firmly in place while the crane is working.

And this is just the beginning. The new H-3 Hydrocrane has dozens of other new features that will speed your jobs—help you make more money. Get in touch with your Bucyrus-Erie distributor for the full story.

115H56C



BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN



HOW

RAY-MAN CONVEYOR BELT
gives you "More Use per Dollar"

**TRAINS
NATURALLY**

**RESISTS
IMPACT**

**HOLDS
FASTENERS**

This Heavy Duty Belt Cuts Cost in Tough Hauls!

Ray-Man Conveyor Belt is engineered to stand up where ordinary belts tear, puncture, or experience fastener pull out. Elastic cushioned strength member plies made from strong, natural and synthetic fabric give this belt resilience to the impact of shock loading flexibility to trough easily and train naturally. Compensated, balanced construction relieves outer ply stress, prolongs belt life. Ray-Man requires no breaker strip and offers exceptional fastener holding ability under extreme conditions of use. Ray-Man Conveyor Belt cuts handling costs because it does a better job . . . and it lasts longer.

Like all Manhattan heavy duty conveyor belts,

Ray-Man is mildew-proof and moisture resistant. R/M's exclusive "XDC" Cover protects the belt against wear, tear, cuts and abrasion to a degree never before attained.

For unusually abusive shock loading, R/M's extra-cushioned Homocord Conveyor Belt may be better suited for your job. An R/M representative will help you compare the advantages of all R/M Conveyor Belts to determine the one that will cut your handling costs most . . . give you "More Use per Dollar" in your operations. Contact him today . . . or write for Bulletin 6906 and 6915.

RM 801A



MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY
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Flat Belts



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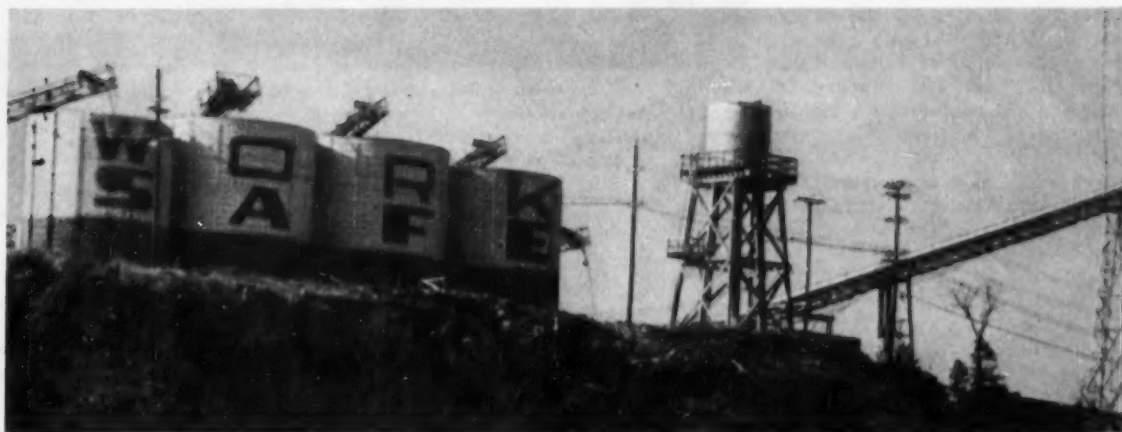
Tank Lining



Abrasive Wheels

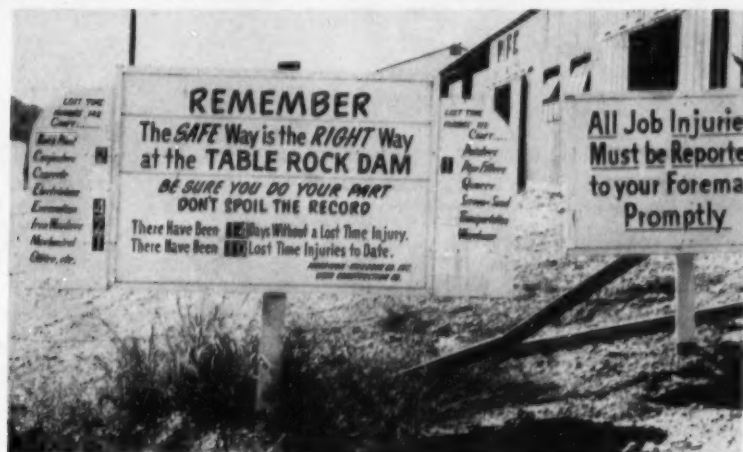
Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

Keep Men Thinking About Safety



HUGE LETTERS painted on aggregate silos at Table Rock Dam in Missouri can be seen from almost anywhere on job. Morrison-

Knudsen Co. strives to cut accidents by making workers safety conscious. Every craft with foreman holds weekly safety meeting.



PROMINENT SIGN records job safety record. Posters on bulletin boards are changed frequently to maintain safety interest. Huge project requires careful safety planning.

"IF A MAN will just think for himself, he will work safely," says Howard Sturgess, Morrison-Knudsen's safety engineer at Table Rock Dam (CM&E April, p 62).

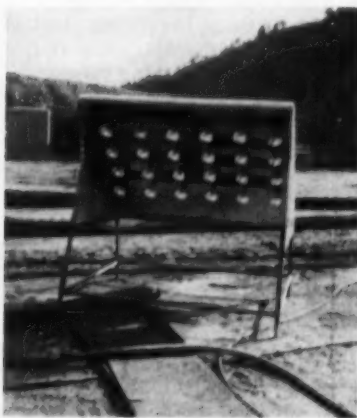
"Our main objective is to make the men at least conscious of safety. Because that's what it takes to prevent an accident. Safety precautions are important, but the individual is the real problem. Unless he is conditioned to safety, chances are he will wind up a casualty."

To keep men thinking about safety, M-K employs lots of reminders. Slogans are posted on signs all over the job, and they are changed frequently. A huge "Work Safe" sign painted on aggregate silos can be seen from anywhere.

Continued on next page



LIGHTS BLAZE at night over concrete placing operations. Stationary flood-light towers 90 ft high carry banks of 32 1,500 watt globes. They can stand 100 mph winds.



CLUSTERS of 24 globes provide both close-up night lighting and heating.

TABLE ROCK SAFETY... continued

Meetings

But the core of the program, according to Sturgess, is the safety meeting. There are two primary types—one for supervisors and the other for workers. Supervisor meetings are held twice a month and generally last about an hour. Chairmanship is on a revolving basis. The project manager and safety supervisor always attend.

Tool-box or worker meetings are held every week by each craft and its foreman. Here, workers are briefed on potential hazards in forthcoming work and shown methods of eliminating them. They discuss safety factors on present work, review accidents and their causes, and—most important of all—develop enthusiasm about safety.

Cutting Hazards

Conditioning the men is the major job, but it is not the complete answer. Job machinery is investigated thoroughly to cut hazards. And this begins right at the quarry.

Rock faces are scaled frequently to bring down loose material which could fall on men working below. In one bad area, a wire screen is hung over the face.

At the dumping chute to the primary crusher, a blue light indicates that it is safe to dump, and a red light warns against dumping. The chute could be full or a man could be working underneath.

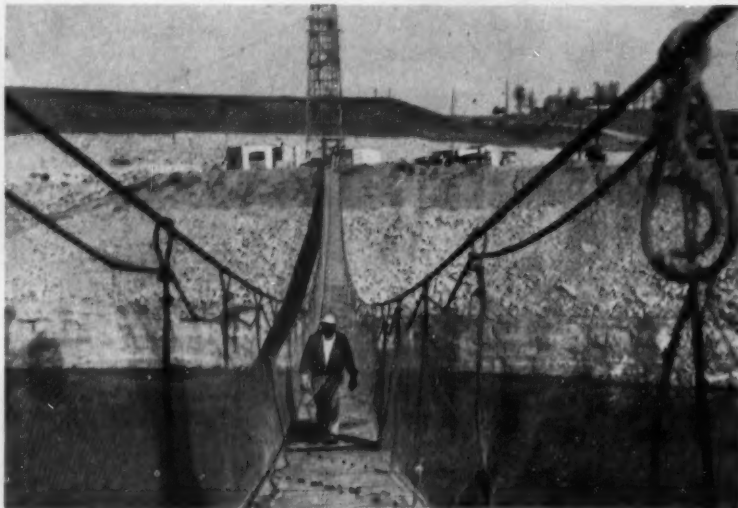
Motorized head pulleys on the belt conveyor make for safe servicing and inspection. The belt rollers are the one-shot type which allows lubrication from one side. The line is well lighted and parallels a service road.

Very little of the batch plant is of combustible material. But fire prevention is still a big consideration. Heating of the control room in the winter is by thermostatically controlled electric heaters; no salamanders or other hazardous oil-burning heaters are allowed. A fire extinguisher and water barrel are located at each landing of the plant, and an emergency electrical cut-off and alarm switch is nearby. A piped water line leads to a fire hose on the top level.

Telephones are installed at each level. If men working on upper levels are unable to reach a stairway, they can escape through a belt-line walkway. Ammonia gas masks are stored in enclosures out-



FIRST-AID UNIT has every facility of two-bed hospital. Fully-equipped ambulance is kept handy. Infirmary can handle all normal types of first-aid and X-Ray work.



FOOT BRIDGE across White River in Missouri Ozarks provides safe walkway for workers. Chicken-wire fencing on each side plus wood cleats on deck eliminate hazard of falls.

side the cold room on each level.

At the cableway, a television screen in the control tower shows a clear, continuous picture of the two main cable sheaves. This cuts accidents because the cableway operator can lower the bucket exactly the number of feet the signal man desires by counting the number of revolutions of the marked sheave. Sheaves and cables are inspected and serviced regularly.

Dumping of buckets has been made safer by a new type bucket that is opened by a hooked pole instead of the hazardous compressed air hose.

Roads around the job are of ample width and generously marked with safety signs. The outside edges on fill sections are outlined by Scotchlite markers for night operations. Haul roads are so laid out there is only one crossing with the public road. And this is controlled by an overhead traffic light.

Night lighting consists of stationary and movable towers, movable light clusters, and fixed spot lights. The stationary tower flood lights are 90 ft high and equipped with pivoting tops adjusted to direct banks of thirty-two 1,500-

watt globes. Their stability is designed for 100 mph winds. Smaller movable towers may be skidded from one place to another. Movable light clusters are several feet high, have banks of 24 globes, and are arranged for night lighting and heating. The spot lights are large carbon lights set on the edge of the cliff overlooking the job.

Aid Station

The first-aid station and infirmary is complete in every detail for first-aid. It has two beds, and every facility which would accompany a complete two-bed hospital, including X-ray. A switch is located in the waiting room for use in the event the medic is out on the job. The switch turns on a red light, mounted on a pole on top of the building, which can be seen from a good part of the job.

Personnel

A. W. Campbell, Jr., is project manager, and Howard Sturgess is job safety engineer for Morrison-Knudsen Co., Inc. Sam S. Elkins is chief of the safety branch of the Southwestern Division of the Corps of Engineers, U. S. Army.

THIS TOO, IS JOB INSURANCE!



Winch equipped CAT D8 tractor assists scraper through heavy mud.



A HYSTER TOWING WINCH ON MY CATERPILLAR-BUILT TRACTOR PROTECTS ME AGAINST... LOSS OF { TIME PRODUCTION PROFITS

● Naturally, I insure myself against all possible losses on all of my contracts. But I consider the price of my Hyster Winch the cheapest insurance premium I've ever paid.

Here's Why: Profits slide down fast when bogged-down equipment causes lost time and production. I cut this loss to a minimum by keeping the job moving with the all-purpose pulling power my Winch provides. At

the same time I am reducing wear and tear on my tractor because the Winch is designed specifically for heavy pulls greater than the tractor drawbar pull.

Thousands of tractor owners have found that the Job Insurance provided by *Winch-pulling power* pays big dividends. For all the facts, call your Caterpillar Dealer (he is also your Hyster Dealer) or write Hyster Company, 2921 N. E. Clackamas St., Portland, Oregon, or 1821 N. Adams St., Peoria, Illinois.

D&D TOWING WINCH

All Hyster Winches are designed for "balanced, matched performance" with Caterpillar-built Tractors. . . . When you operate a Caterpillar-Hyster "Machine Package" you know you are getting your money's worth.

Caterpillar and Cat are registered trademarks of the Caterpillar Tractor Co.

HYSTER COMPANY

A full line of Winches for Caterpillar-Built Tractors





MR. ROY WALTON
President,
**Western Concrete and
Equipment Co.,
Los Angeles.**



1956 Ford T-800. Maximum GVW 45,000 lb.; GCW 65,000 lb. New thermostatically controlled cooling fan available at slight extra cost.

BIG FLEET OWNERS BUY MORE FORD

"Here's how we get a \$5,280 daily bonus with our 85 Ford Trucks

"Our Ford T-800's carry 2,000 lb. more concrete than other trucks of comparable GVW. They earn us \$6 extra per trip. When they make 880 trips a day, we get a bonus of \$5,280!

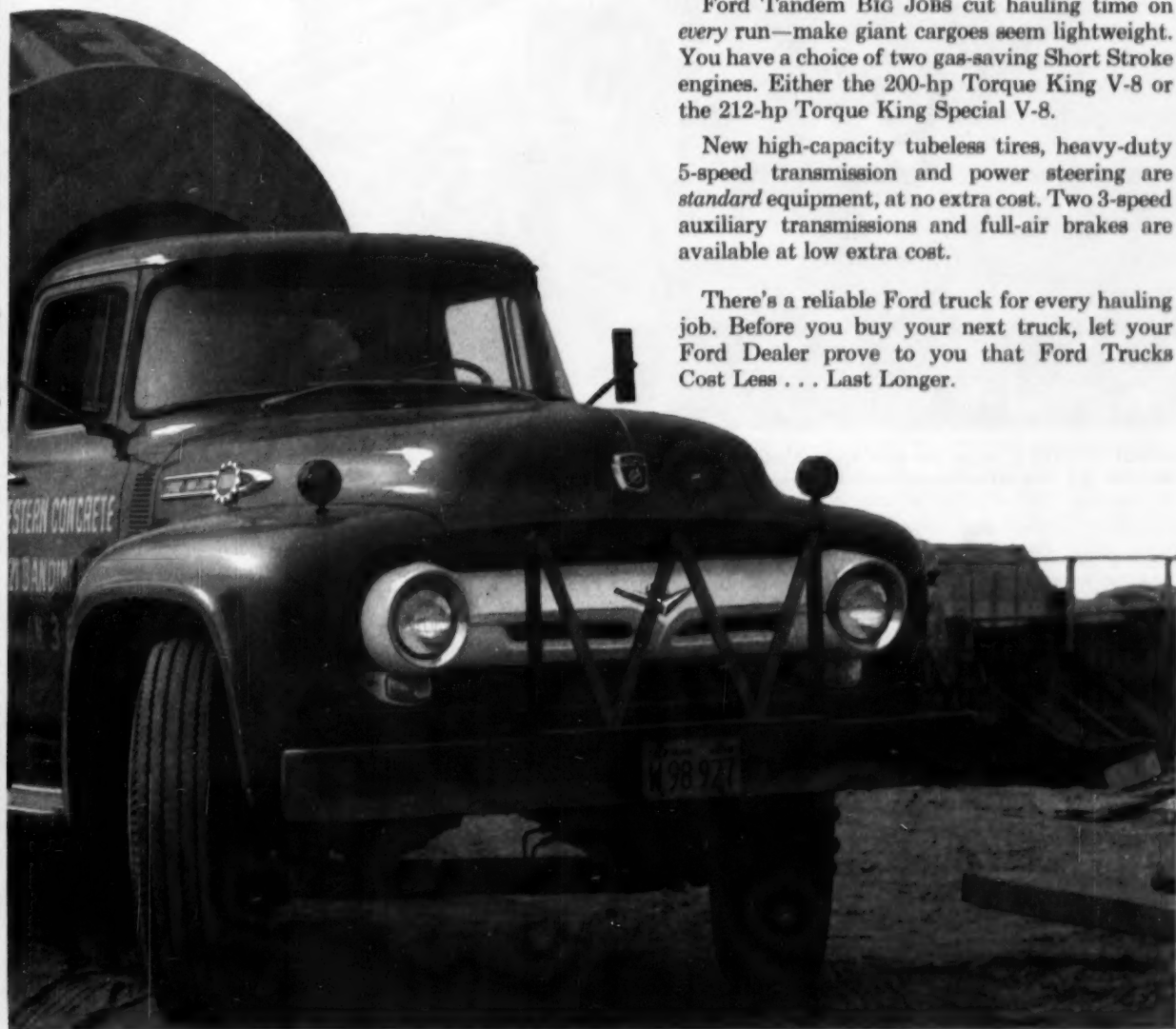
"The lighter weight of our Ford T-800's allows a 28,000 lb. payload," says Mr. Walton. "With Fords we haul 6,160 yd. of concrete in 880 trips during an 8-hour day. Competitive trucks we have tried, require 948 trips to do the same job. *That's how Ford trucks cost less for us.*

"And that's why we've used Fords since 1944," Mr. Walton explains.

Ford Tandem Big Jobs cut hauling time on every run—make giant cargoes seem lightweight. You have a choice of two gas-saving Short Stroke engines. Either the 200-hp Torque King V-8 or the 212-hp Torque King Special V-8.

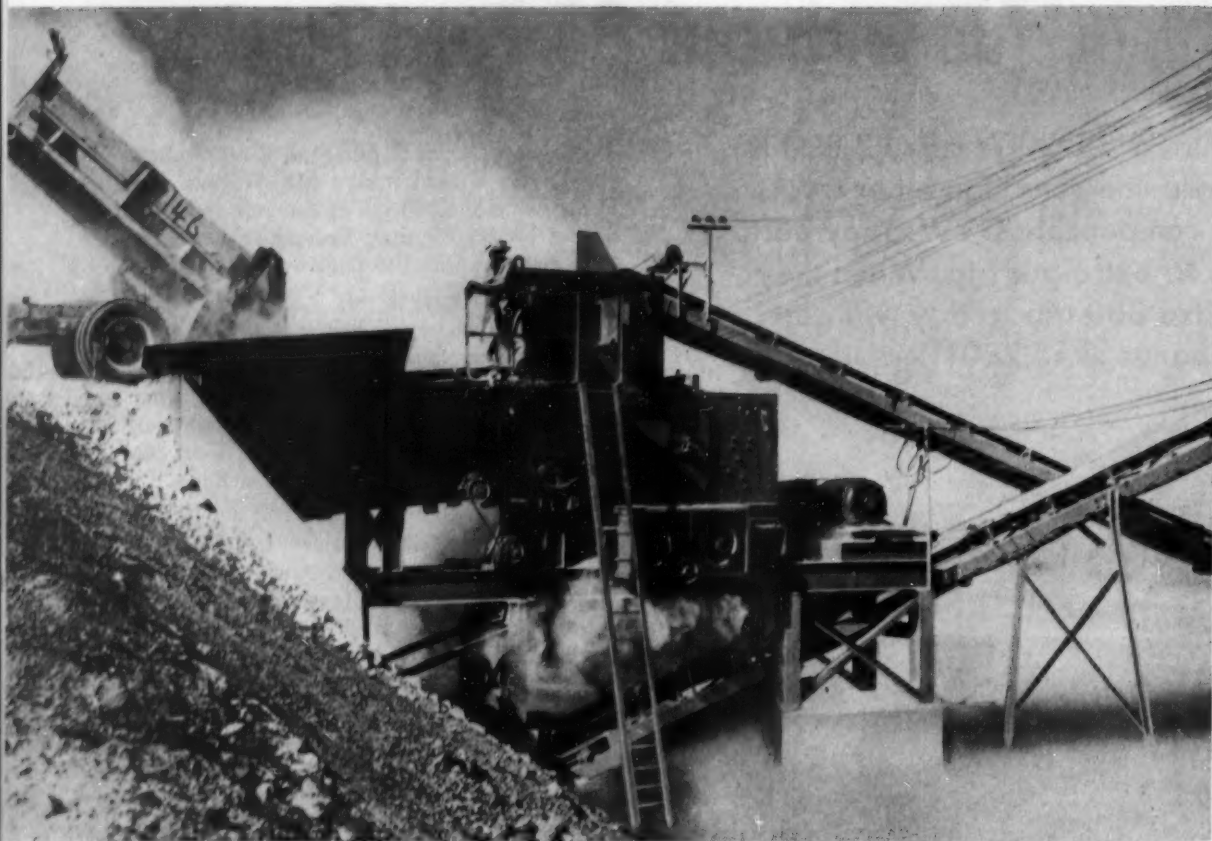
New high-capacity tubeless tires, heavy-duty 5-speed transmission and power steering are *standard* equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

There's a reliable Ford truck for every hauling job. Before you buy your next truck, let your Ford Dealer prove to you that Ford Trucks Cost Less . . . Last Longer.



TRUCKS THAN ANY OTHER MAKE

PRODUCING AGGREGATES



IMPACT BREAKER is one of four basic types of primary crusher used by contractors. This 36 x 48-in. typical impactor is fed by 42-in. wide and 14-ft long apron conveyor, and is producing caliche road rock in closed circuit. (Kennedy-Van Saun photo.)

3. Crushers — Part One

By W. A. RUNDQUIST,
Vice President,
Pioneer Engineering Works

EXCEPT FOR RARE OCCASIONS when construction aggregates can be processed simply by a screening operation (some river gravels, for instance) production of specification material requires crushing. The amount of crushing will vary from "some" to "almost total," depending on the source material.

In the case of quarry rock, we often refer to 100% crushing, even though a small percentage of the material is reduced to size by the blasting operation. Reference to 100% crushing arises from the fact

that, until recently, all material delivered from the quarry was run through the primary crusher or breaker. As pointed out in the chapter on feeders and their application, it is more and more becoming the practice to by-pass the primary crusher with some type of screening or scalping arrangement. Under such conditions, 100% crushing implies that all material to be sized would eventually pass through one or more crushers.

In gravel operations, especially in areas where depletion of good pits is becoming a problem, it is not uncommon to find the required amount of crushing approaching 50%. Even in so-called good pits crushing may amount to 10 or 20%.

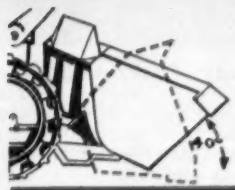
Inadequate consideration of the

crushing phase of an operation can bottleneck the entire plant and cause excessive production costs. Crushers represent one of the heavier outlays in the initial installation cost of a quarry plant. So, unfortunately, the purchaser frequently penalizes himself by installing a crusher having either insufficient capacity to keep up with the rest of the units in his plant, or one having a receiving opening too small to take advantage of the savings that can be effected by a larger size feed. This holds true whether a stationary or a portable plant is involved.

With gravel plants, the situation is altered somewhat because there are limits to the size of crushers that, from a practical point of view,

SO FAST...YOU'D THINK IT WAS ON WHEELS...

the all new Rear-engine 1¾ yd. International® Payloader®



NEW PRY-OUT FORCE

International-built 77 net hp diesel engine, short-coupled power train, positive hydraulic action and 40° tip-back bucket on ground break-out pads combine to give tremendous pry-out force.

	1st	2nd	3rd
Forward	0-1.6	0-4.5	0-10.1
Reverse	0-2.1	0-5.7	0-13.1

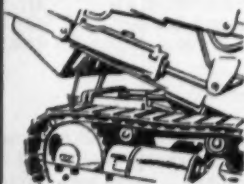
NEW HIGH SPEEDS

The Payloader's top speed of 10 mph forward is nearly three times faster than most other competitive units. Top reverse speed of 13 mph is four times faster.



NEW VISIBILITY

Operator is always "on top of his work" because of rear-engine design. He works faster with less effort. To shift or steer, he pulls a hydraulic lever. There is no master clutch or steering pedals.



NEW SERVICIBILITY

Only tractor-shovel with tilting body, the Payloader permits mechanic to get at all four sides of engine easily and quickly. Tilting body for servicing takes only a few minutes.

Here's the new tractor-shovel that surpasses all competitive models for speed...gives you fastest loading cycles...yet offers you crawler traction and stability for greater production and more profitable work in any terrain...in any weather. It's the all new, rear-engine, 1¾-yard International Model 12 Payloader...with new, high speeds, unmatched in crawler history...with new pry-out force necessary in rock and other tough materials...with new visibility, a result of rear-engine design...and new serviceability obtained by tilting the body to reveal engine and other components. See all these and many other International Payloader features at your International Construction Equipment Distributor, soon. Then try it! It's so fast...you'll think it's on wheels.



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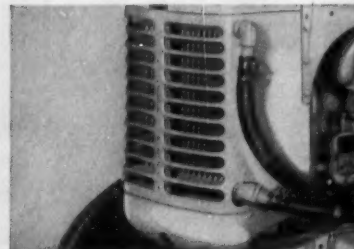
Check These Points Thoroughly before buying a combination Tractor-Compressor

Absence of these engineering design features can mean less work done and more cost on your next job.

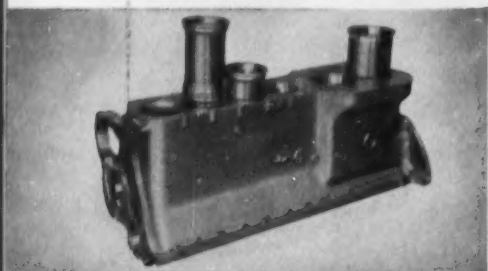
In recent years, combination tractor-compressor units have been increasingly popular. This is due, in large measure, to the fact that machines of this type are much easier to keep at work all day than their counterparts: an ordinary tractor and a standard portable compressor. To insure that you get the maximum benefit from any combination tractor-compressor unit, check these important points before buying.



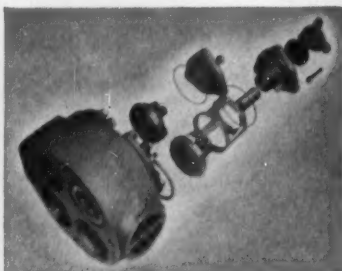
✓ **Location of the compressor air receiver** is important. The air receiver must be exposed to give you cool outside air in every operating condition, and should not hug the hot engine or be located next to the gas tank.



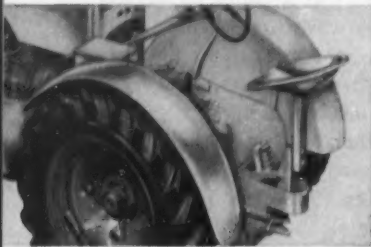
✓ **An air-cooled aftercooler** permits the tractor-compressor to deliver clean, cool, dry air hour after hour. Best cooling results can not be obtained from those units using a water-cooled manifold as an aftercooler.



✓ **Replaceable wet sleeves** in the cylinder construction of your tractor-compressor eliminate costly reboring jobs, and give you more efficient cooling by directing a 360-degree flow of water around each individual cylinder.



✓ **Interchangeable and replaceable compressor valves** let you get longer service life from your tractor-compressor. This feature also lowers your maintenance costs and assures top performance.



✓ **Wrap-around fenders are a must.** This is a major safety factor, particularly when the tractor is operating on rough ground or on highways and streets.



✓ **Many attachments for use with the unit** give you greater job versatility. Be sure your machine is designed for use with attachments such as the front-end loader, backhoe, and other tools.

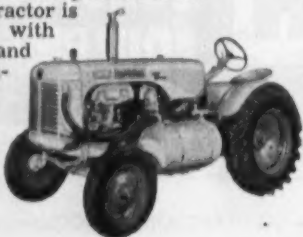


✓ **Plenty of operating space** is important, too. Be sure that your tractor-compressor permits the operator to drive and work efficiently and safely. He should be able to stand up while operating the unit.

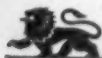
✓ **A hood that is easily and quickly removable** helps reduce the time needed for minor repairs on your tractor-compressor. It permits preventive maintenance practices, too. Ask for this feature.

✓ **The fastest possible travelling speed** is a time-saving feature of the tractor-compressor. Be sure that your unit can get you from job to job in the shortest possible time.

✓ **If it's built and designed by one manufacturer** as a complete unit, you can be sure of maximum performance. Make sure that the tractor is designed to "work" with the compressor unit and is not an ordinary industrial tractor. The engine, too, should be a product of the manufacturer offering the unit. Your unit should "belong together."



These features can be found only in the Le Roi Tractair — a combination 42-hp wheel tractor and a 125-cfm air compressor. Be sure you get all the savings in time and money that the engineering design of Tractair offers you. Check before you buy.



LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

PRODUCING AGGREGATES ...

continued from page 118

are feasible. Further, in portable plants, there are definite mechanical and weight limits with which to contend. More will be said about these considerations later in this series of articles.

Our main purpose here is to discuss crushers of various types and their applications. First refer back to the illustrations on pages 173 and 176 in last month's article on feeders to see where the crushing stations are located with respect to the rest of the units in a plant. They show a simple quarry plant and a simple gravel plant, each having a primary crusher and a secondary crusher selected to give reasonably balanced performance under what normally may be called average conditions. The quarry crushing units are merely typical, and other types of crushers could as readily be shown in their stead. The others represent the kinds of crushers most commonly used in portable gravel plants.

There are many types and varieties of crushers. It is important to note, therefore, that some are quite satisfactory for general, all-around use, whereas other types while perfectly satisfactory from a mechanical standpoint should be recognized as applicable to special or specific uses only.

Perhaps more patents have been issued, and still more applied for, on rock crushers than on any other piece of equipment used in the production of aggregates. In spite of all the ideas advanced by this army of inventors, the field of crushers can be reduced to those that have stood the tests of usage and adoption by the field generally. Our discussion will be centered around these, giving consideration only to those crushers most commonly used to produce construction aggregates.

How to Break Rock

Basically there are four ways of making big rocks into little rocks, mechanically speaking. These are:

1. Pressure or compression
2. Impact
3. Shear
4. Attrition

Pressure or compression

Pressure implies that a squeezing action takes place between two surfaces. In nearly all cases, however, a slight amount of attrition takes place. Typical examples: jaw crushers, gyratory crushers, roll crushers.

Pressure crushing should be specified when the material is:

- a. Hard and tough.
- b. Abrasive.
- c. When minimum fines are required.

Pressure type crushers are not as well adapted to sticky materials as are some other types of crushers. Except for the roll crusher, they are not recommended for the production of graded sizes below, say, 1½ in.

Rolling compression (a form of pressure crushing) is better adapted to the crushing of friable mate-

rials, not inclined to be sticky, where graded sizes below 1½ in. are desired, but where a minimum of extreme fines is wanted. Rolling compression gives close control over gradation of product.

Impact

Impact, as applied to the production of aggregates, implies an instantaneous, sharp blow delivered to the material by a hammer. When this occurs the material is shattered partly by the impact of the hammer, partly by the impact of the material striking a breaker



No clutter or confusion at paving site. Premixed concrete delivered by Dumpcretes ready for placing.

PAVING ON THE OHIO TURNPIKE

Non-agitated Hauling Meets Every Test

On sections C-2 and C-3 of the Ohio Turnpike there's no clutter at the paving site. No paver, no water trucks, no men to run them.

Just spreaders and finishers, plus a Dumpcrete or two discharging 4 yards of premixed concrete in 60 seconds.

The automatic central mixing plant is midway on the 10-mile job. Three men run it. 14 Dumpcretes haul its 95,000 yd. production.

Here's the bonus. The single plant supplies concrete for bridges, culverts, walls and widening as well as paving.

"It's an efficient, high-production operation. We like it," says D. W. Winkelman, contractor.

This method cuts costs on small jobs, too. It's approved by 25 state highway departments. Write for bulletins today.



Central mixing plant located midway on job.



Slump, cylinder, beam and air test (above) all O.K.

Manufacturing Division, Maxon Construction Co., Inc.
2600 Far Hills Ave., Dayton 9, Ohio

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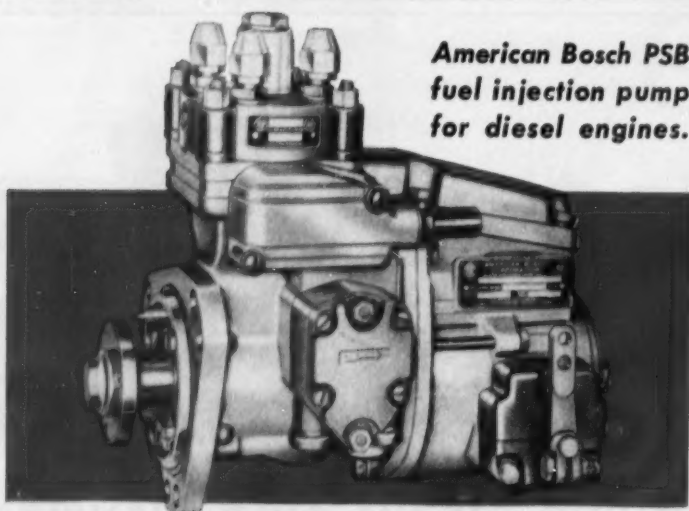
City _____

**MAXON
DUMPCRETE**

Fastest from plant to pour

CHART FOR SELECTION OF CRUSHERS

Material to be Crushed	Extremely Hard	Hard to Very Hard (abrasive)	Hard to Very Hard (mildly abrasive)	Brittle or Friable	Soft (not sticky)	Soft (wet or sticky)
PRIMARY CRUSHERS	Jaw	Jaw Gyratory	Jaw Gyratory Impactor	Jaw Gyratory Impactor Single Roll	Jaw Impactor Single Roll	Impactor Single Roll
REDUCTION CRUSHERS	Roll Cone	Roll Cone	Roll Cone	Roll Cone Hammermill	Hammermill Cone Roll	Hammermill



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fuel injection pump
for diesel engines.**

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PRODUCING AGGREGATES . . . continued

bar or plate, and partly by material striking material. Typical example: the hammermill.

Impact crushing may be specified:

- When the material is not too abrasive (not over 5% to 7% silica).
- When the material contains a high percentage of soft stone which it is desired to remove by screening or other suitable means.
- When a more cubical particle is wanted.
- When it is desired to obtain a well-graded product from top size to bottom size in one stage of crushing operation.
- When materials have a higher than normal moisture content, tending to make them damp and somewhat sticky.

Shear

Shear implies a cutting or slicing action. It is not used alone but is found in some types of crushers in combination with attrition or pressure or both. Typical example: single roll crusher.

A crusher employing shear (in combination with pressure and attrition) may be specified:

- When material is fairly soft, yet friable.
- When the silica content is fairly low (not over 5% or 7%).
- When minimum fines are required.
- When a relatively coarse product (not under 2½ in.) is desired.

Attrition

Attrition implies that the reduction will be accomplished by a rubbing or grinding action between two surfaces. In most crushers adaptable to the production of construction aggregates, attrition appears in conjunction with some other form of crushing, such as impact. Typical example: hammermill with grate-bars.

This method of crushing may be specified:

- When material is friable.
- When material is not abrasive (low silica content).
- When maximum fines are desired in the finished product.
- When closed-circuit production of fines is not feasible or practical.

Some authorities ignore shear
Continued on page 126



EIMCO 105 -- MORE POWER FOR MORE WORK

Eimco 105 Tractor-Excavators are balanced to give maximum work efficiency in every phase of digging and loading. Compare these figures—(A) 39,200 pounds of digging force at the bucket lip as the 105 moves into the rock pile; (B) 39,200

pounds of lifting capacity for break-out power.

This power gives the operator the same potential in productive capacity as he would have if you bought him a boom type shovel costing three to four times as much.

How does Eimco design a small (1½ yard) Tractor-Excavator to out-produce every other machine in its price range?

The answer to this is Eimco's unique Tractor design which provides better balance, lower center of gravity and delivers full engine horsepower to the bucket at all times.

Eimco also makes it easier to operate the 105 Tractor-Excavator. The operator sits up front where he can see what he is doing. Two small handles, easily held in one hand, control all movements of the

Tractor. The operator does more work with less effort, stays efficient the entire shift.

Other firsts in the Eimco 105 Tractor-Excavator include (1) independent track control so that one track can be run forward while the other turns reverse; (2) separate final drives for each track; (3) full track oscillation on the tractor when equipped with loading or excavating attachment; (4) elimination of master clutch and drag-track steering; (5) Unidrive transmission in which gearing always rotates in the same direction; (6) all alloy steel construction; (7) clutches that never need adjustment — and many other exclusive features.

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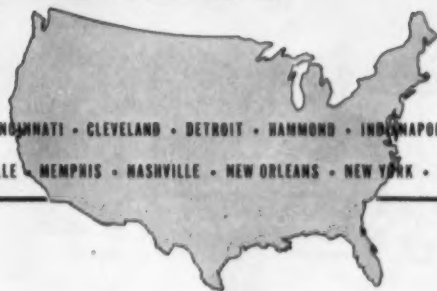


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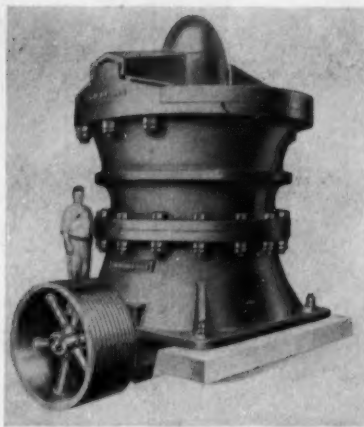
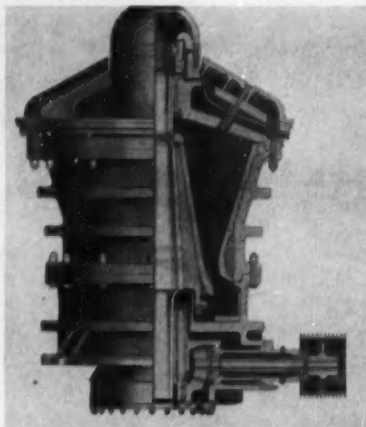
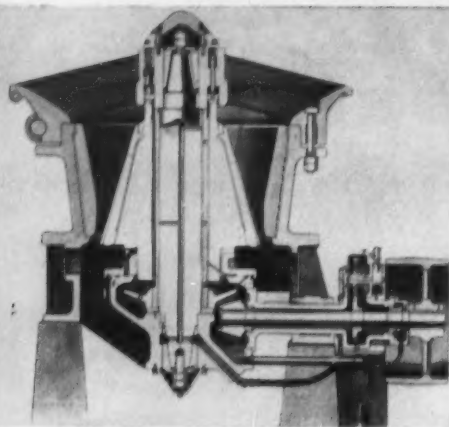
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cutting work for you to save you time, labor and money.



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GYRATORY CRUSHERS have high capacity because of circular crushing chamber and discharge area. Fixed shaft gyratory (left)

differs from most others in that eccentric is inside the head, not at bottom. Telsmith, Allis-Chalmers, and Nordberg photos.)

and attrition, selecting instead the two most prominent factors—impact and compression—and arranging the types of crushers more or less arbitrarily as follows:

(Greatest impact, least compression)
High speed hammermill
Impact breaker

Low speed hammermill
High speed rod mill
Ball mill
Low speed rod mill
Roll mill
Single roll crusher
Secondary gyratory, or cone, crusher
Primary gyratory crusher

Jaw crusher
Twin or triple roll crusher
(Greatest compression, least impact)

However, shear and attrition are important when considering the specific type of crusher best suited for a particular application—that is, application to the kind of mate-

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Not one dirty engine in 6 years while moving 78,613,000 yards of material!



Peter Kiewit Sons' Company and Morrison-Knudsen Company, Inc., in a joint venture, moved 78,613,000 cubic yards of material in completing Garrison Dam in North Dakota. Using Phillips 66 heavy duty oils exclusively, they report: "We didn't have a single dirty engine during the 6 years on the job. No sludge, no ring or bearing trouble."



"You can't ask for better performance than Phillips 66 motor oils gave us!"

Lynn Arbogast, mechanical superintendent, Peter Kiewit Sons' Company, Omaha.

For six years, in completing Garrison Dam, Peter Kiewit and Morrison-Knudsen men and machinery worked 20 hours a day, during the summer season. They operated 361 pieces of equipment, including 76 Euclid 25-yard wagons, 47 track-type tractors, 13 motor graders, plus draglines, shovels, cranes and rollers. PK-MK set a new record for total yards of material moved in one day: 117,000 yards. The big "Eucs" daily piled up mileage equal to that from New York City to Los Angeles and

back to Bismarck, North Dakota.

PK-MK used Phillips 66 heavy duty motor oils and greases *exclusively* on the Garrison job—in fact, 90 box-car loads in three seasons' operations. Lynn Arbogast, mechanical superintendent, said: "We had to have oils and greases we could depend on. Yours more than proved out to us. You can't ask for better performance than your oils and greases gave us. I would recommend your heavy duty oils to anyone."



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It's Performance That Counts!

PHILLIPS 66 HEAVY DUTY MOTOR OILS

PRODUCING AGGREGATES ... continued

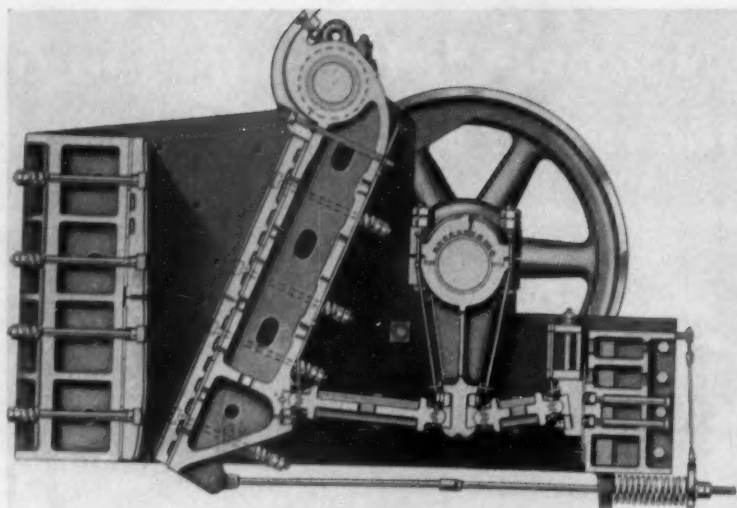
rial to be crushed as determined by its physical properties.

Stage of Reduction

When crushing soft stone fairly free of abrasive materials, it sometimes is possible to reduce the stone in one stage by using one of the various types of impact crushers. Generally, however, crushing is done in several stages. This means that the stone is gradually reduced in size by two or more crushers, all but the first one fed from the material processed through a preceding crusher. Thus, in most cases, a primary crusher or breaker will be used ahead of a reduction crusher. In some of today's larger installations, three, four, or even more crushers may be needed to produce the various sizes of aggregates required.

In crushing operations, stage of reduction is the difference between the maximum size of stone fed to a crusher and the top size of the product produced. For all practical purposes, this top size of product will have at least one dimension approximately equal to the crusher setting. Thus, if we feed a crusher 3-in. material and produce a 1-in. product, the stage of reduction is 2 in. (Ratio of reduction, however, is 3 to 1.)

There are two basic reasons why it is necessary to know something about the stage of reduction of a crusher. In the first place, there usually are mechanical limitations on the size of feed a crusher will take and the size of product it will produce from any given feed. Further, factors of mechanical strength of the crusher, power required, and cost of maintenance must be considered.



DOUBLE TOGGLE JAW CRUSHER has jaw hung from fixed shaft at top. Jaw bottom gets arc reciprocating motion from eccentric shaft, toggles, and crank. (Allis-Chalmers photo.)

Stage of reduction is a somewhat minor factor in primary crushers. Other factors, such as size of feed opening and capacity are more important. In reduction crushers, however, it is one of the most important factors to consider in keeping down crusher wear and in obtaining efficient production of the desired product.

Stage of reduction for any particular type of crusher can be derived by a mathematical formula. However, crusher manufacturers generally specify the maximum feed for a given size or type of crusher to produce a given product.

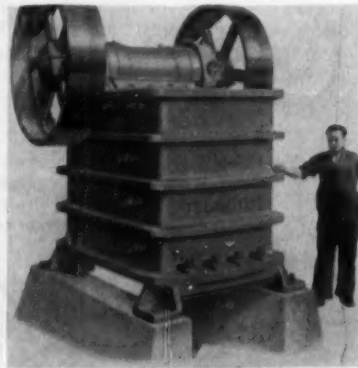
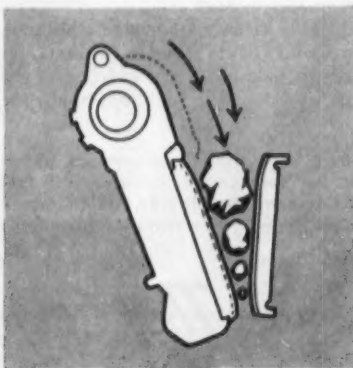
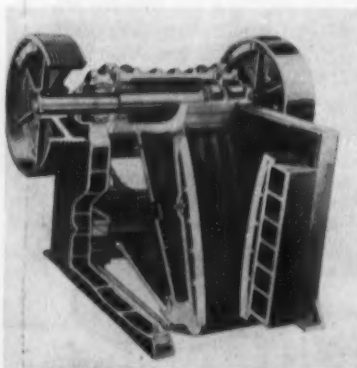
Summarizing the matter of reducing rock or gravel in easy stages, gradual reduction is the most reliable way in which the necessary control over gradation of the finished product can be obtained at a reasonable cost of production.

Crusher Choice

For any particular job there would seem to be more than one type of crusher suitable. The trick lies in choosing the crusher most suitable. In addition, the contractor or aggregates producer has the problem of selecting a crusher having widest adaptation to the various sites or job locations at which he may find it necessary to operate with the same equipment.

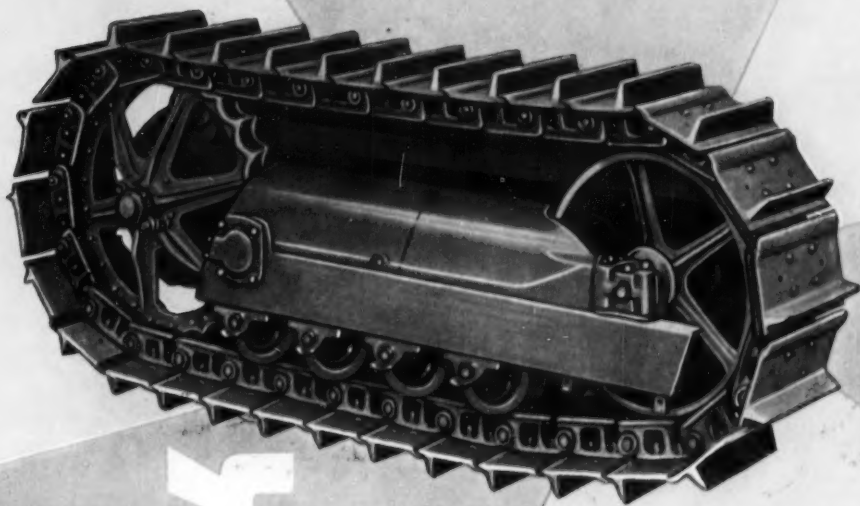
As a practical approach to this problem, Page 122 shows a guide to selection of crusher types. Note that the table divides crushers into two classifications: primary and reduction. If more than one reduction crusher is required, the additional crushers will be selected according to size of product desired from each and according to the capacity or output required. Also when selecting reduction crushers,

(Continued on page 132)



SINGLE TOGGLE JAW CRUSHERS have only one shaft, center of jaw pivots against toggle. Motion of jaw is circular at top, portion of which is eccentric and on which jaw is mounted. Bottom changing to elliptical at bottom. (Pioneer and TelSmith photos.)

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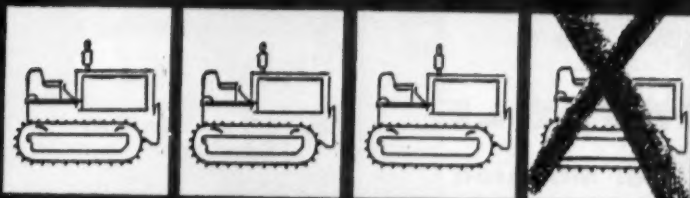
They can be. The present expanded program is planned to keep highway capacity in step with America's economy until 1975 — provided each highway dollar is spent as effectively as possible.

Next January, the most important convention and exhibition ever held by the road building industry will take place. All the technical advances in methods, equipment and materials that will make it possible to build the new roads better, faster and cheaper will be on display. If you're part of this industry, you can't afford to miss it. Even if you're not personally involved with highway construction, you'll want your city, town or county represented.

For the sake of a safer, stronger America . . . attendance by everyone concerned is a must!

This message contributed in the interests of better highways for future progress by the McGraw-Hill Construction Publications — — ENGINEERING NEWS-RECORD
CONSTRUCTION METHODS AND EQUIPMENT • CONSTRUCTION DAILY • INGENIERIA INTERNACIONAL CONSTRUCCION • 330 West 42nd Street, New York 36, New York

With men who know converters best...it's Twin Disc 3 to 1!



For years, the construction industry has been the "proving ground" for heavy equipment. And the toughest jobs, under the severest conditions, have constantly been assigned to the crawler tractors. That's why men who built and used crawlers were among the first to recognize the advantages of torque converter drive... and are the men who know converters best.

Today, the four manufacturers of the most powerful crawler tractors available all have torque converter equipped models. Of these, all three of the "Big 3" volume producers—Allis-Chalmers, Caterpillar and International Harvester—have special torque converter transmissions, in which they standardize on Twin Disc Torque Converter Components.

TWIN DISC
CLUTCHES AND TORQUE CONVERTERS

TWIN DISC

Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois
Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Tulsa

6 reasons for a torque converter in crawler tractors

For higher work output... and longer equipment life, more and more contractors are ordering their crawler tractors equipped with torque converter drive.

A torque converter offers six profitable, proved advantages applicable to your crawler tractors.

1. Multiplies torque *exactly* as needed (three-stage units up to 6:1).
2. Engines work up in the maximum efficiency range all the time, delivering constant high horsepower output... doing more work than units equipped with mechanical drive.
3. Power is matched to load demands automatically, with gear shifting minimized or eliminated — where mechanical transmissions must *stay* in the starting gear ratio, even after starting load resistance is reduced... operator efficiency is boosted.
4. Heavy load pick-up is smooth, even, without clutch slippage... better flotation is obtained.
5. Overloads, shock loads and vibrations are cushioned out, through fluid connection... providing longer tractor life with less maintenance.
6. Infinite variety of ratios is available to work with, permitting smooth, accurate control of loads and delicate "inching" under power.

For these reasons, today, the four manufacturers of the most powerful crawler tractors available have torque converter drive models. Of these, all three of the "Big 3" volume producers — Allis-Chalmers, Caterpillar and International — have designed special torque converter transmissions, in which they have standardized on Twin Disc Torque Converter Components. In each instance, Twin Disc Engineers worked closely with the manufacturer to aid in developing this complete torque converter power package to individually suit each crawler tractor's particular characteristics.

PRODUCING AGGREGATES ...

continued from page 128

keep in mind that there should be a balance between the primary crusher and the reduction crusher, or crushers, with respect to capacities or output. More will be said about this in later articles discussing plant design and layout.

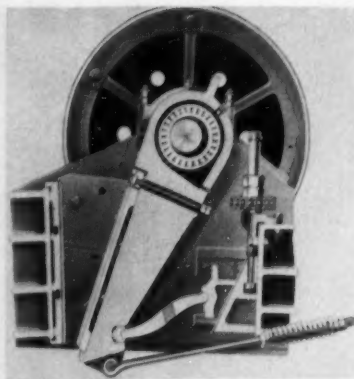
Primary Crushers

The various types of crushers can be described in broad, general terms relating largely to principles of operation. Details vary accord-

ing to each manufacturer's design, so study the manufacturers' catalogs or specification sheets for detailed information on mechanical construction. First consider the primary crushers identified in the table on Page 122.

Gyratory Crushers

These crushers derive their name from the gyrating action of a heavy mantle or crushing head located within a deep conical bowl. The lower portion of the shaft that supports the mantle is mounted in an eccentric bearing which is driven



JAW ADJUSTMENT in this overhead eccentric unit is made by chain, sprocket, and screw. (Diamond Iron Works photo.)

NEW BATCH TYPE ASPHALT PLANT

(M-40: 100 to 120 T. P. H. M-60: 160 to 180 T. P. H.)



Completely PORTABLE

All Units Wheel Mounted

This new H & B mobile batch type asphalt plant can be moved from one job to another and set up in a minimum of time. All units are wheel mounted, and no crane is needed for erection. All piping and wiring are permanently installed, with quick disconnects.

The design and engineering of this plant meet all state specifications, and provide a most flexible set-up arrangement. All remotely located units are driven with electric motors. There are no shafts, universal joints, chains, gears, etc.

The complete plant (tanks, oil heater, power units, piping, etc.) is available from one source. For complete information see your nearest H & B distributor or write direct.

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Engineers and Manufacturers

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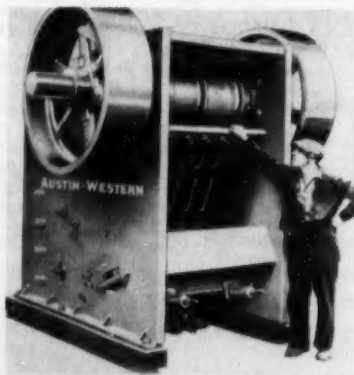


through a right angle gear and pinion. This generates a gyrating action. As the eccentric is turned, the mantle moves from minimum open to maximum open for every 180 deg of eccentric rotation. This produces a squeezing action on the material fed to the crusher throughout the whole 360 deg of eccentric rotation. Hence the gyratory is for the most part a pressure type crusher.

The crusher is fed at the top on either or both sides of a spider that suspends the shaft. Material crushed is discharged from the bottom. The size of crusher usually is designated, in inches, by the size of the receiving opening or distance from the spider to the bowl liner.

Because of the shape and volume of the crushing chamber, gyratory crushers are massive, heavy, and tall. The outer shell is made up of several castings in rings which are bolted together. Most employ forced feed lubrication to bearings and eccentric.

(Continued on page 135)



STEEL SHIMS (in opening in side of crusher base) adjust this 2540 jaw crusher. (Baldwin-Lima-Hamilton photo.)

When bridge designs can be simplified...

Have better appearance... require less maintenance...

Yet cost less to build...

WHY
don't you design
all bridges and
buildings for
welding

IN ARKANSAS

Plate girder bridge over the Spring River, Highway 62, at Hardy, Arkansas; 1078'-2" length with a 26 foot roadway.



IN TEXAS

Three level separation of State Highway 225 and 156 in Harris County, Texas. Completed in 1953. 145 tons of steel. Both structures are on curves and both are skewed.

**Cost reductions of 15% to 20% realized
in welded bridge design
...with substantial savings in steel**

THE accelerated trend to the use of welded steel design for highway bridges is evident from surveys of highway departments across the nation.

Savings in steel as well as cost of fabrication and erection are proving to average 15% to 20% over riveted designs.

Examples shown are typical of welded bridges reported in Texas, California, Kansas, Connecticut, Ohio, Florida, New York, Iowa, Arkansas, South Dakota and numerous other states.

"Studies in Structural Arc Welding" helpful to bridge designers are available by writing . . .

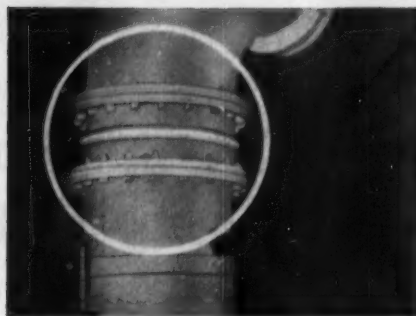


THE LINCOLN ELECTRIC COMPANY

Dept. 2711 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

How long can a U. S. Rubber Expansion Joint last



*...some have
been on the job
since 1926,
the year
they were
invented!*

**Here are just a
few reasons why
these flexible
connections are used
in pressure
or vacuum pipe lines...**

- U. S. Rubber Expansion Joints are resilient and, therefore, do not, like metal, set permanently when compressed.
- Constant flexing merely keeps "U. S." joints "alive"...prevents them from becoming brittle.
- They absorb both axial and lateral deflection far more than metal joints. Greater insulation against vibration and pump noises is provided.
- There is never any electrolysis, corrosion or erosion.
- U. S. Rubber joints handle pressures from 40 lbs. to 125 lbs. Compare!

- The outside diameter of the arch is smaller than that on metal joints. Face-to-face dimensions (even with multiple arches) are smaller.
- Weight is much less. This, plus the fact that no gasket is needed between flanges (unlike metal joints) results in a more easy installation, lowering the cost.
- "U. S." was the first to develop rubber expansion joints. They are at work in every kind of industry, prolonging the life of equipment in pressure or vacuum pipe systems. Obtainable at any of the 28 "U. S." District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

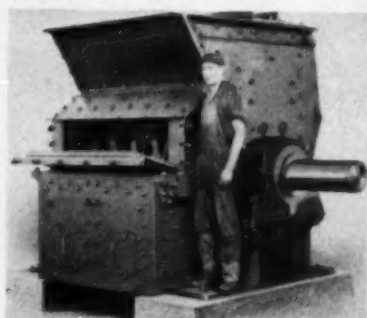
Watch NCAA football, Saturday afternoon, NBC-TV



Mechanical Goods Division

United States Rubber

PRODUCING AGGREGATES . . .
continued from page 132



IMPACT BREAKER shatters material with hammers, seen through inspection door of 54 x 48-in. unit. (Jeffrey Mfg. Co. photo.)

The gyratory crusher has a high capacity for the size of feed it will take because of the circular crushing chamber and circular discharge area. This annular discharge opening minimizes the production of a slabby product because of the arc effect of the crushing chamber. By the same token, the circular shape of the feed opening which is favorable or slabby material gives the gyratory an advantage when working in thinly stratified stone or rock. On the other hand, the gyratory is susceptible to clogging if the feed is sticky or dirty. It is not a crusher to be recommended for extremely hard materials. When necessary the gyratory can be fed from two sides.

Jaw Crushers

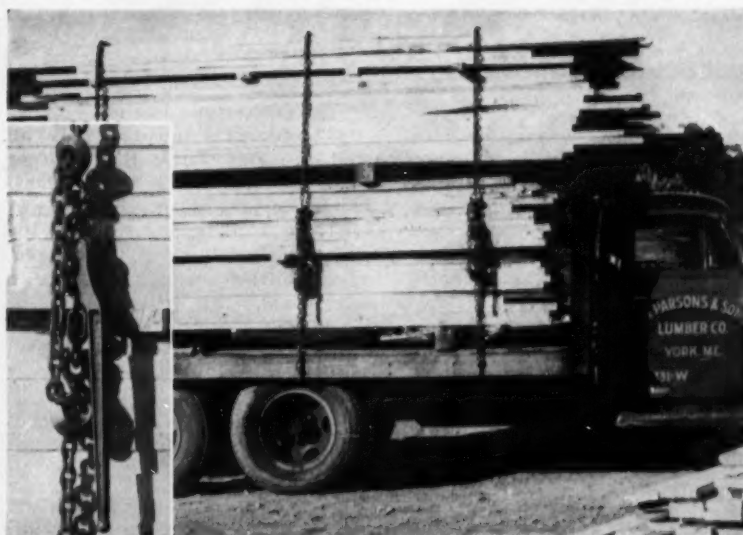
Through the years, a number of different kinds of jaw crushers have been placed on the market. Only two, however, have stood the test of time sufficiently well to be given consideration here.

1. The Blake type, or double toggle crusher.
2. The overhead eccentric, or single toggle crusher.

Blake Type

The Blake type crusher, also known as the double toggle crusher or the swing-jaw crusher, has a heavy jaw suspended from a fixed shaft at the top of the crusher. Reciprocating motion in an arc is imparted to this jaw at the bottom through a double toggle arrangement actuated by a connecting rod mounted on the eccentric portion of a second shaft. Motion of the connecting rod at the bottom is up and down, which alternately moves the jaw back and forth through the toggle arrangement.

(Continued on next page)



LOADS SAFELY BOUND

Safety conscious contractors tie down their truck loads of construction material with Laughlin Load Binders! There's no chance for injury or loss because the smooth lever action takes up $4\frac{1}{2}$ -inches of chain—holds lumber, piles, pipe, sheet material positively—safely! This tough, drop forged and

heat treated binder is the most versatile available—and it's made for the strongest chain! One Laughlin binder will handle four chain sizes! Merely switch Clevis Grab Hooks to fit the chain you're using! Keep Laughlin Clevis Grab Hooks on hand to fit your chains—then there'll be no delays!

100% HOLDING POWER



When genuine Crosby® Clips secure wire rope rigging and tackle, men and materials are 100% safe! Positive gripping power gives confidence to workers, and confidence means top working efficiency. High strength steel is formed into the world-famous "Red U-Bolt"®. High wings on the drop forged base hold the rope securely in place. Look for the "Red U-Bolt"! You'll see it used

*REGISTERED TRADEMARK

on ropes of all sizes, because only Crosby offers a complete range of sizes to fit $\frac{1}{8}$ " to 3" diameter ropes!



AN EYE FOR SAFETY!

. . . that's the eye design that was originated by Laughlin engineers. The ear of a shackle only one size smaller slips through the pear shaped eye—a design that conforms more closely to the line of pull—makes Laughlin Turnbuckles stronger and safer! Hex ends on the hefty body make take-up fast and easy. Weldless, hot galvanized turnbuckles, forged from special steel, are available from Crosby-Laughlin Distributors in a variety of end fittings and in sizes from $\frac{1}{4}$ " x 4" to $2\frac{3}{4}$ " x 24"!

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN Division

American Hoist and Derrick Company
FORT WAYNE 1, INDIANA

PRODUCING AGGREGATES ... continued

The moving jaw works against a stationary jaw so that the material fed the crusher is subjected to a squeezing action, or pressure, with each stroke.

Because of the tremendous pressures built up in the eccentric bearings of the Blake type crusher, most of them have forced lubrication, with cooling water circulating through the bearing housings.

Overhead Eccentric Type

The Blake type jaw crusher has its counterpart in practically all but the very large sizes (larger than 42x48 in.) in the overhead eccentric jaw crusher.

There is only one shaft in the overhead eccentric type crusher. The central portion of this shaft, on which the moving jaw is mounted, is eccentric. When the shaft is rotated, the jaw moves with a motion that is circular at



Here's the business end of a heater

When you buy a heater, don't stand in front of it; stand behind it. All heaters are hot in front, but their value to you depends on the rear end.

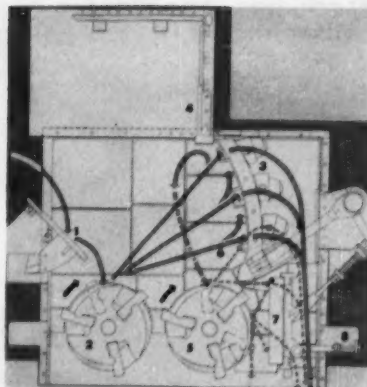
If you want *circulated warm air indoors, powerful spot heating outside*, if you want to *dry plaster, pour and cure concrete and keep the job rolling* in any weather, you need a Master heater.

It's a compact furnace-on-wheels, with starter, fan, thermostat, filter, pressure atomizing burner, insulated fire chamber and all. It rolls into place, starts at the flip of a switch, needs no vent and burns low cost kerosene or fuel oil.

We think it gives you more good heating for your money than any other type heater. Write for the free folder "Summer Warmth in Winter" or call your Master Distributor and see if you don't agree.

MASTER VIBRATOR COMPANY
360 Stanley Ave., Dayton 1, Ohio

MASTER



TWO-ROTOR IMPACTOR SKETCH shows paths material travels as it passes through crusher. (Universal Engineering Co. photo.)

the top, gradually changing to elliptical at the lower end. The lower end of the jaw pivots against a single toggle. Material is crushed by pressure between the moving jaw and a stationary jaw opposite.

In the overhead eccentric crusher, greatest movement of the jaw is at the top, whereas in the Blake type greatest movement is at the bottom. This gives the overhead eccentric crusher a forced feed action, with a greater inherent output factor. But at the same time it introduces the factor of attrition crushing to a greater degree than is found in the Blake type. There is a tendency for a large, blocky feed to hang up in the Blake type crusher, which often nullifies its advantage of some less jaw wear.

Of the several varieties of jaw crushers available today, the overhead eccentric type offers many advantages. Generally speaking, it is probably safe to say that per dollar of investment no other type of crusher has as large a feed opening, as high an output, or is as easily maintained and repaired. Further, it has become a popular choice of primary crusher for all around use in the quarry or gravel pit, except for the size range above the maximum in which it is currently built. It is the most universally used crusher in the portable gravel plant because of its durability and strength, coupled with compactness and relatively light weight.

Size of jaw crushers usually is designated, in inches, by the width of the jaws and the distance between jaws at the top.

Impact Breakers

As with the hen and the egg, it is hard to tell which came first,

All-wheel-drive traction PLUS!



Digs More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back at ground level gets BIGGER LOADS with less spillage.

Carries More

Heaped loads are cradled closer and lower for greater stability while carrying. Exclusive load shock-absorber also cushions the load, smooths the ride, and permits faster movement with less spillage.

Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result—you deliver more yards per load and more loads per hour.

One of the big reasons why the new all-wheel-drive "PAYLOADER" tractor-shovels can accomplish more *work* and can do more *jobs* is the BONUS tractive effort provided by their power-transfer differentials. This important feature — exclusive with "PAYLOADER" in the tractor-shovel industry — automatically transfers more power to the wheels on the firmest footing. You get traction and action instead of wheel-spinning inaction on sand, mud and snow.

These outstanding machines also have "no-stop" power-shift transmissions, torque-converters, planetary final drives, power-steering, 4-wheel power brakes. Your "PAYLOADER" Distributor is ready to show you *all* the superior features of these three new models. A demonstration will convince you that they are the finest, most productive units, size for size, in tractor-shovel history.

THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, Ill.

Send data on "PAYLOADER" Tractor-shovels

- ☐ 4 wheel drive types to 2 1/4 cu. yd.
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THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY INTERNATIONAL HARVESTER COMPANY



toughest

Royal Blue rope
is made of the *toughest*
rope wire ever developed...
Roebling Type 1105



John A. Roebling's Sons Corporation, Trenton 2, N. J., Subsidiary of The Colorado Fuel and Iron Corporation BRANCHES: ATLANTA, 934 AVENUE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5535 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-HILFORD RD., EVENDALE • CLEVELAND, 19325 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1733 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6.



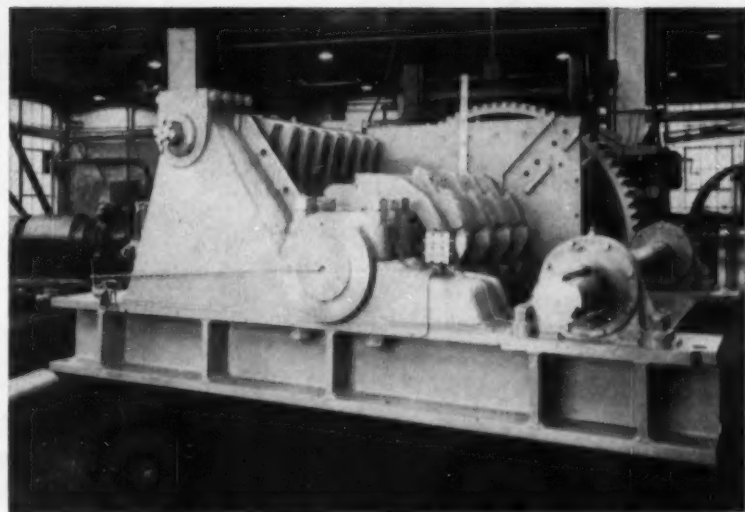
PRODUCING AGGREGATES ... continued

the impact breaker or the hammer-mill. Probably the latter, with the impact breaker beefed up and adapted to primary crushing of large blocky feed. In fact, there are impact mills and hammermills so much alike in basic design that the only difference appears to be one of mass, or size. Nevertheless, within the past few years, the impact type of primary breaker has found considerable application to "once through" production of aggregates from a large size feed where the stone or rock is relatively soft and where the abrasive qualities are on the low side.

In any gradation of product from an impact breaker, there will be a high percentage on the fine side. Therefore, in spite of its increased popularity, the impact breaker probably should not be classed as a general crusher with the broad application of either the jaw or gyratory.

As presently built, impact breakers have either one or two rotors each equipped with three, four, or more rows of hammers that turn at relatively high speeds. When the material is fed to these machines, it drops into the crushing chamber where it is struck by the rotating hammers and flung against breaker plates, bars, grates, or the like, each impact shattering the stone into smaller and smaller particles.

For each type of impact breaker, there appears to be a specific gradation curve for the speed at which



SINGLE ROLL CRUSHER crushes by shear, impact, pressure, and attrition. This partly assembled unit is fitted with deep grooved anvil and segmented roll with slugger teeth.

the rotors are turned, the kind of material that is fed, and the size of feed.

Unlike the hammermill, the impact breaker has no grate bars at the bottom through which the material must pass; it falls freely between the rotor and the end of the crushing chamber. Hence there is little attrition crushing involved. In spite of this, however, maintenance of hammers, liners, and breaker bars or plates becomes a factor when the impact breaker is used in extremely hard or excessively abrasive materials.

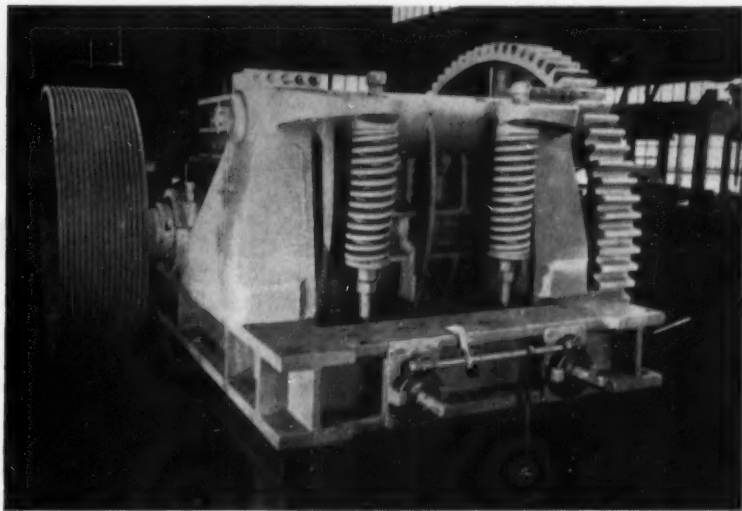
Size of impact breakers usually is designated, in inches, by the dimensions of the feed opening.

Single Roll Crushers

The single roll crusher is designed for special, rather than all-purpose, use. It is particularly well suited for crushing moist, sticky material or rather soft material, which might have a tendency to pack in other types of crushers. It is well adapted to the production of cubical particles without the production of an excessive amount of fines. If it can be avoided, the single roll crusher is not recommended where more than 7% of silica is present. It crushes by means of a combination of shear, impact, pressure, and attrition.

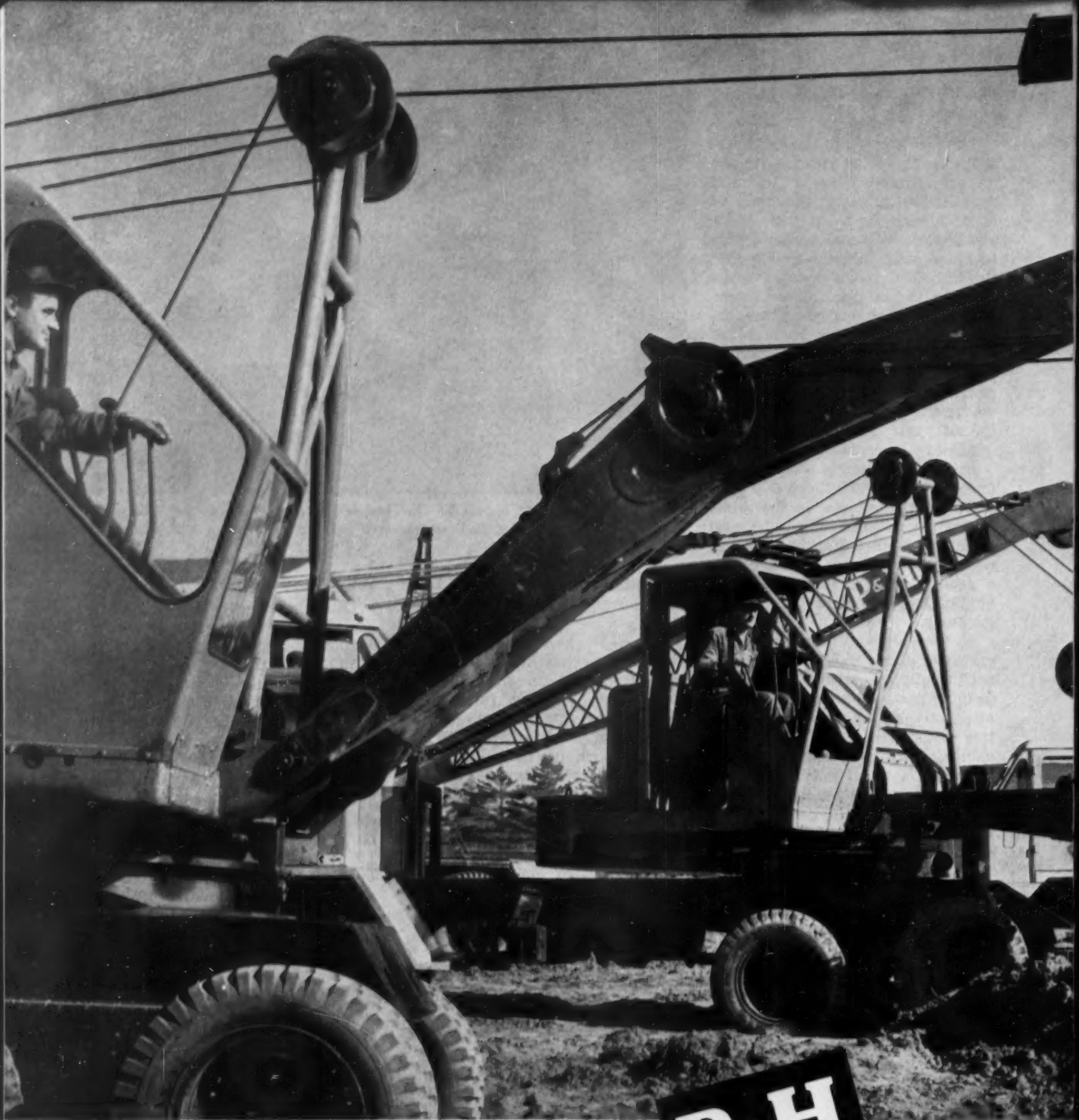
Basically, it consists of a relatively large diameter roll on which are mounted a series of knob-like projections or teeth cast to have a modified cutting or shearing edge on the leading face. Material to be crushed passes between the roll and an adjustable crushing plate or anvil. Single roll crushers are rarely used to produce material smaller than 2½ in.

Size of single roll crushers usually is designated, in inches, by the diameter of the roll at the root of the teeth and the length of the roll.



SAFETY RELEASE SPRINGS on single roll crusher protect it from damage should some noncrushable material enter into the crushing chamber. (McLanahan & Stone Corp. photos.)

The fourth article on Producing Aggregates will appear in our November issue. It will continue the discussion of crushers, detailing such things as reduction crushers, crusher selection, and crusher foundations.



Proving that **P&H** has

Today P&H is recognized as the leader in the excavator industry.

Why?

Because P&H, and P&H alone, has taken excavators out of the steam shovel era and applied automotive-type construction, automotive-type power trains and automotive-type controls to power cranes and shovels.

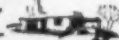
The result?

Power crane and shovel performance that delivers the highest net operating profit.

No matter what your shovel or crane needs are, be sure to get the full, profitable benefits of P&H unit rolled construction, *fabricated by arc welding*. This feature *alone* eliminates troublesome assembly by multiple mechanical joints, bolts, rivets and tie rods!

Get the full P&H story—proof that P&H has the “guts” to do any job; proof that is borne out every day on the Harnischfeger Proving Grounds where every shovel and crane is thoroughly tested. Harnischfeger Corporation, Milwaukee 46, Wisconsin.

the **P&H** Line



TRUCK CRANES DIESEL ENGINES POWER SHOVELS PREFABRICATED HOMES HOISTS SOIL STABILIZERS WELDING EQUIPMENT OVERHEAD CRANES



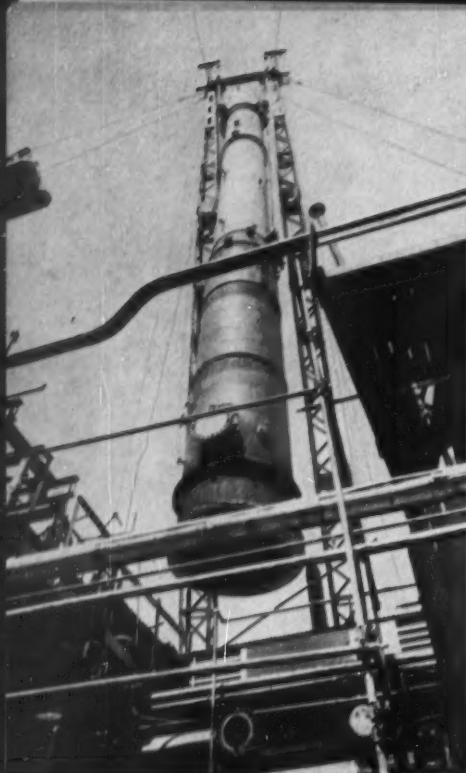
the GUTS to do the job!

The unretouched photograph above shows P&H equipment being tested at the Escanaba, Michigan, Harnischfeger Proving Grounds

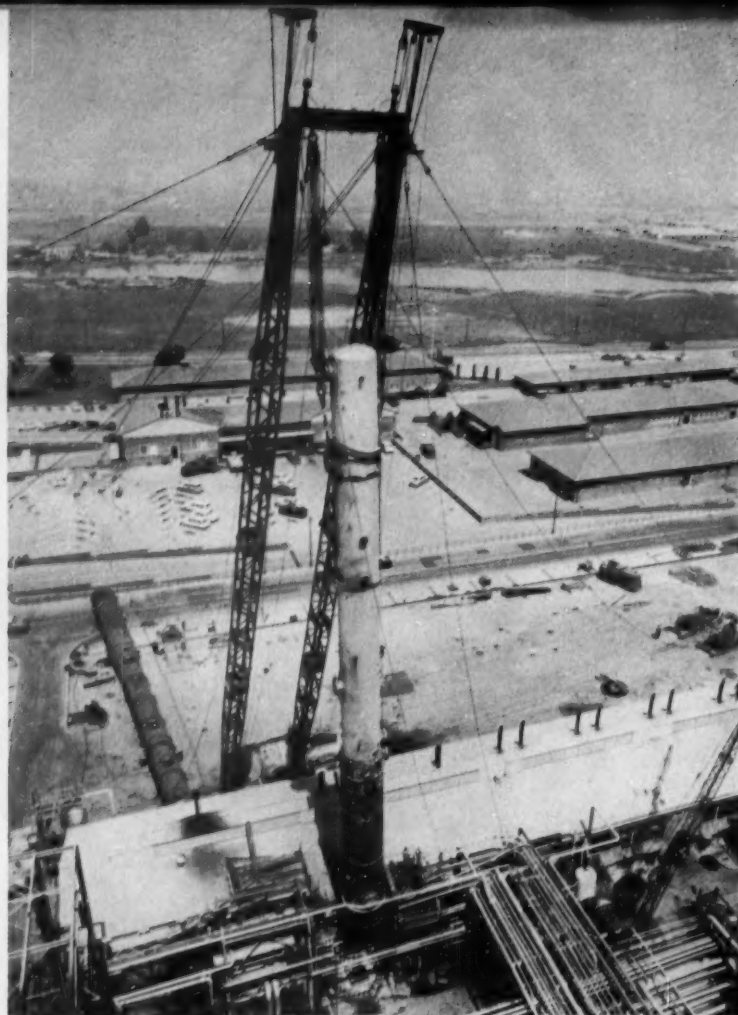
For Modern Engineering, Look to

HARNISCHFEGER

Power Crane & Shovel Division



PRESSURE VESSEL 125 ft high is lifted 30 ft through maze of piping and then swung 56 ft laterally across compressor house.



SHEAR LEG consists of linked gin poles. Rig is boomed by two pairs of hoist-driven guys anchored in parking lot. (left)

Shear Leg Extracts Tall Tower

REMOVING A BLISTERED 125-ft pressure tower at the Los Angeles refinery of Union Oil Co. demanded special rigging skills. The 100-ton vessel had to be lifted up 30 ft through a maze of piping and then swung 56 ft laterally over a compressor house.

Pacific Crane & Rigging Co. handled the job with a 175-ft shear leg that could boom 20 deg from the vertical. The contractor fabricated the rig from two steel gin poles. Truck cranes placed the ball and socket base plates of the gin poles on timber mats just beyond the compressor house. The tops of the poles were linked by a steel headframe which formed the shear leg and also served as a beam for supporting lifting blocks.

Movement of the erected shear leg was controlled by six stationary guy cables and two pairs of hoist-driven guys. Stationary guys were

anchored to buried 12x12-in. timber deadmen. Live guys were reeved through blocks attached to deadmen 300 ft from the base of the shear rig. Deadmen were anchored in vertical mats of 12x12-in. timbers, 13 ft deep and 40 ft long.

Hoisting

Rigging for vertical lifting consisted of two gasoline-driven hoists with separate lines to each of two six-sheave load block assemblies hung from the headframe. Bottom blocks were shackled to the tower 15 ft from the top by a pair of friction chokers composed of 10 strands each of $\frac{3}{4}$ -in. cable.

Prior to lifting the old tower, all piping, platforms, ladders, and insulation were removed. To break the vessel loose from its foundation, hydraulic jacks were placed at the tower base and combined with the pull of the load lines.

After the old tower was lifted and moved across the building by booming the poles to vertical, it was lowered to wooden rollers. An outhaul line going to a third drum on the back guy hoist was attached to the bottom of the tower. As this line was hauled in, the tower was lowered progressively into a horizontal position. The same technique in reverse raised a replacement tower, which will serve as part of fluid catalytic cracking unit.

Rigging installation required four weeks. Actual moving of the towers after rigging was complete took three work days.

Personnel

J. R. Ramirez was design engineer and S. F. Sawyer construction engineer for Union Oil Co. Rigging contractor was Pacific Crane & Rigging Co., a division of Macco Corp.


*Save time and money
on low-cost drainage jobs...*

AMBRIDGE Sectional PLATE

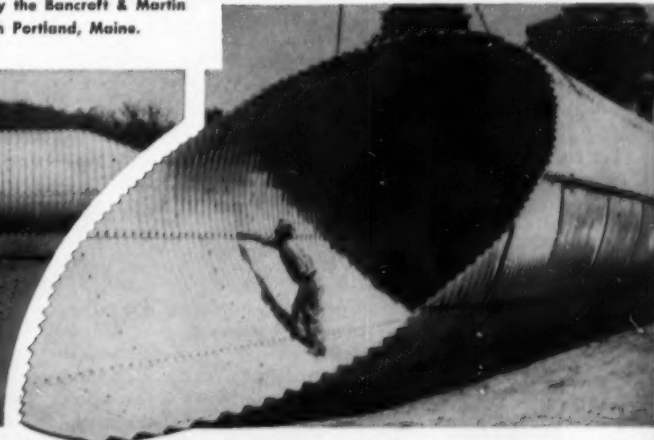
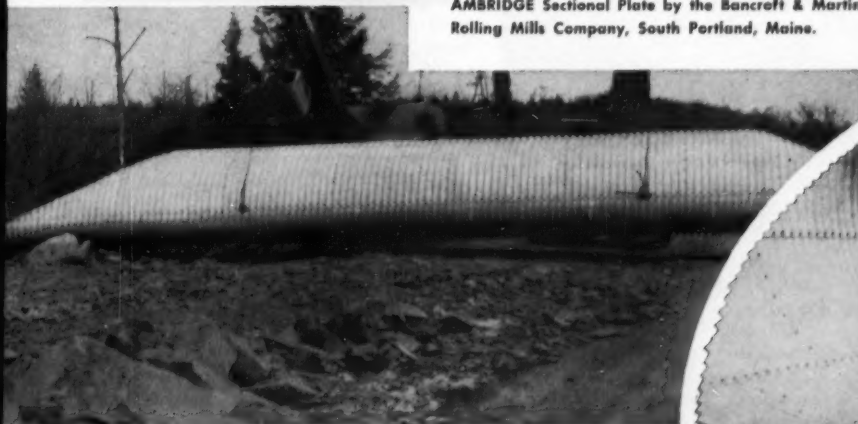
AMBRIDGE Sectional Plate for pipes, arches and pipe-arches meets the specifications of the American Association of State Highway Officials, and can be adapted to all state, railroad and government specifications.

Fabricated in 2" deep corrugations on 6" centers with standard punchings . . . and galvanized after fabrication, AMBRIDGE Sectional Plate is furnished to accommodate any shape or size of pipe, arch, or pipe-arch, complete with bolts. Special details, such as asphalt coating, hook bolts, beveled ends, and skewed ends, are furnished as specified for each job.

For further information, we suggest that you contact the office nearest you. Or, an inquiry direct to our Pittsburgh headquarters will bring detailed information.



The Harris Brook Bridge, near New Portland, Maine, is a 156"-diameter, 86'-long pipe culvert made from AMBRIDGE Sectional Plate by the Bancroft & Martin Rolling Mills Company, South Portland, Maine.



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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMBRIDGE *Sectional* PLATE

UNITED STATES STEEL



STUMPED by high track replacement costs?

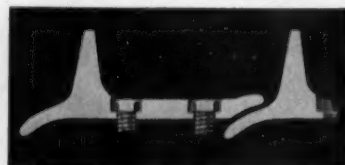
Switch to extra-tough AMSCO® MANGANESE STEEL TRACTOR SHOES

When the going is extra tough, as in rocky areas or abrasive mineral soils . . . tractor shoe replacement can become a major cost item. Both repair time and down time eat up profits.

Switch to "the toughest steel known" . . . Amsco Manganese Steel . . . for tracks and grouser bars. Check their much longer service life against the moderate extra cost. Add to this the greater

efficiency and pulling power of your tractor, over a longer period of time. The answer: *important operating economies.*

Amsco Manganese Steel gives excellent resistance to abrasion accompanied by impact . . . actually *work-hardens* in use. Write for full information on long-wearing Amsco Manganese Steel Tractor Shoes—the economical answer to high track-replacement costs.



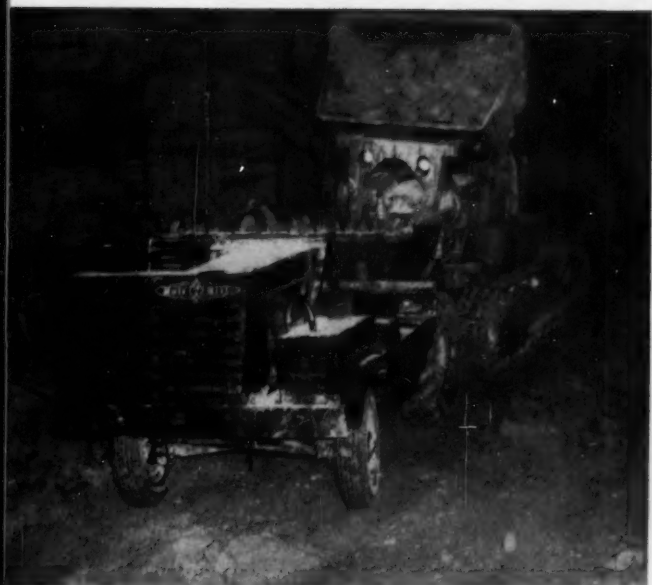
COUNTER-SUNK BOLT HOLES

Amsco Track Shoes have holes counter-sunk for less wear on bolts. Saves cost of replacing bolts when changing shoes.



AMSCO

American Manganese Steel Division • Chicago Heights, Ill.
OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC



EIMCO 105 loads British-made, 6-ton capacity Muir-Hill quarry truck modified so that the body can be lifted off the chassis.



HOIST HOOK lines from Ruston-Bucyrus crane are attached to eyes welded to top of truck body. Crane raises body up 80-ft shaft.

Crane Lifts Removable Dump Body

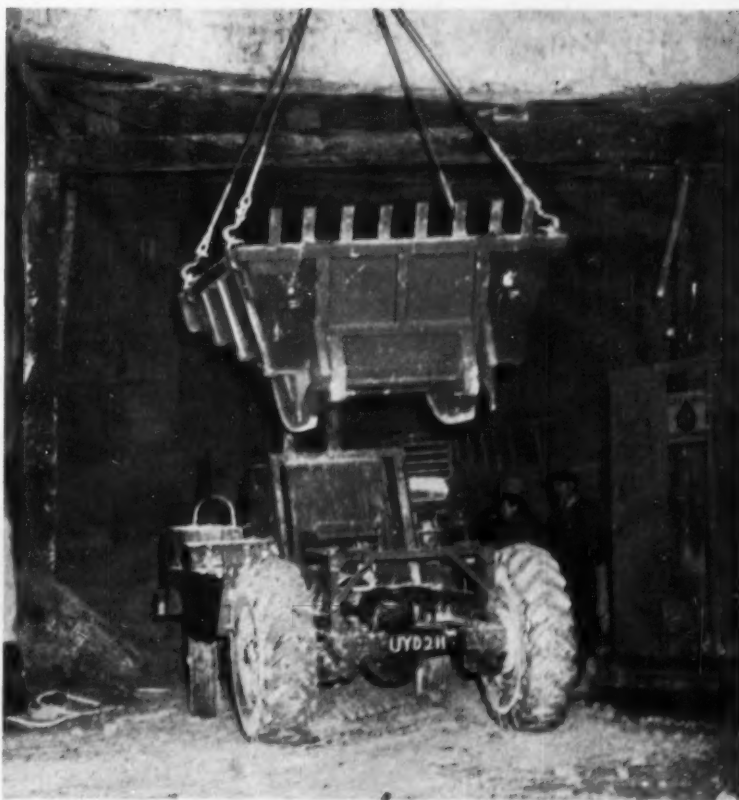
TO MUCK OUT an abandoned underground quarry, a British contractor operates trucks with removable dump bodies that can be raised up an 80-ft shaft by crane and discharged over a special unloading bay.

About 180,000 yd of stone spoil are being removed from a series of narrow passages that make up the quarry. It will be lined with concrete and used as underground storage space by the British Ministry of Works. The contractor, A. E. Farr, Ltd., is handling the job with a combination of American and British equipment.

Two Eimco 105 overhead loaders and two International Anthony TD-6 tractor shovels are loading the spoil into a fleet of British-made Muir-Hill quarry-type trucks with a payload capacity of six tons.

The low-slung Muir-Hill trucks are particularly useful in this operation because they can be driven quickly from a loading point at the end of one of the narrow passages to the discharge shaft. Headroom varies from 12 to 16 ft.

Normally, the body of the Muir-Hill truck is fixed to the chassis so that it tips back 90 deg to discharge its load. But for this operation all the usual attachments between the body and the chassis are re-



EMPTY BODY is lowered down shaft to waiting truck. Truck's frame has been modified to cradle the body on the chassis. Trucks are mucking out 700 tons of stone a day.



RUSTON-BUCYRUS 38RB crane brings truck body up from shaft and starts to swing it over unloading bay where 7- and 12-yd English rear dump trucks wait to be loaded.



CRANE OPERATOR controls discharge. A steel bar, extending beyond sides of truck body, catches in V-shaped block on top of bay so that front end pivots down to discharge.

moved and an auxiliary frame is bolted to the chassis. This frame cradles the body securely, but allows it to be removed by a vertical lifting force supplied by a crane. The frame is built so that it helps guide the body back to the truck chassis when it is returned down the shaft.

Four sling eyes are welded and bolted to the dump body so that a four-part hoist hook and ring sling from the crane can be attached to it. A Ruston-Bucyrus 38-RB crane is lifting the loaded dump bodies up the shaft.

Crane Controls Discharge

When the dump body clears the shaft, the crane swings it over a specially-designed unloading bay. This is a steel-beam structure built so that the trucks that are removing the stone can drive underneath it.

A steel bar has been welded to the rear of the dump bodies so that it extends about 12 in. beyond the body on each side. The crane positions the body so that this bar can be placed in a V-shaped block on top of the unloading bay.

When the bar is in place, the crane gently lowers the lead end of the dump body and it pivots down and discharges into the waiting trucks. Should the truck fill up before the dump body is empty, the crane operator raises the tilted part of the body until the next truck is in position, and then lowers it again.

When the dump body is empty, it is brought back over the shaft by the crane and lowered. The truck driver and one other man guide the body back on the chassis and remove the hoist hooks.

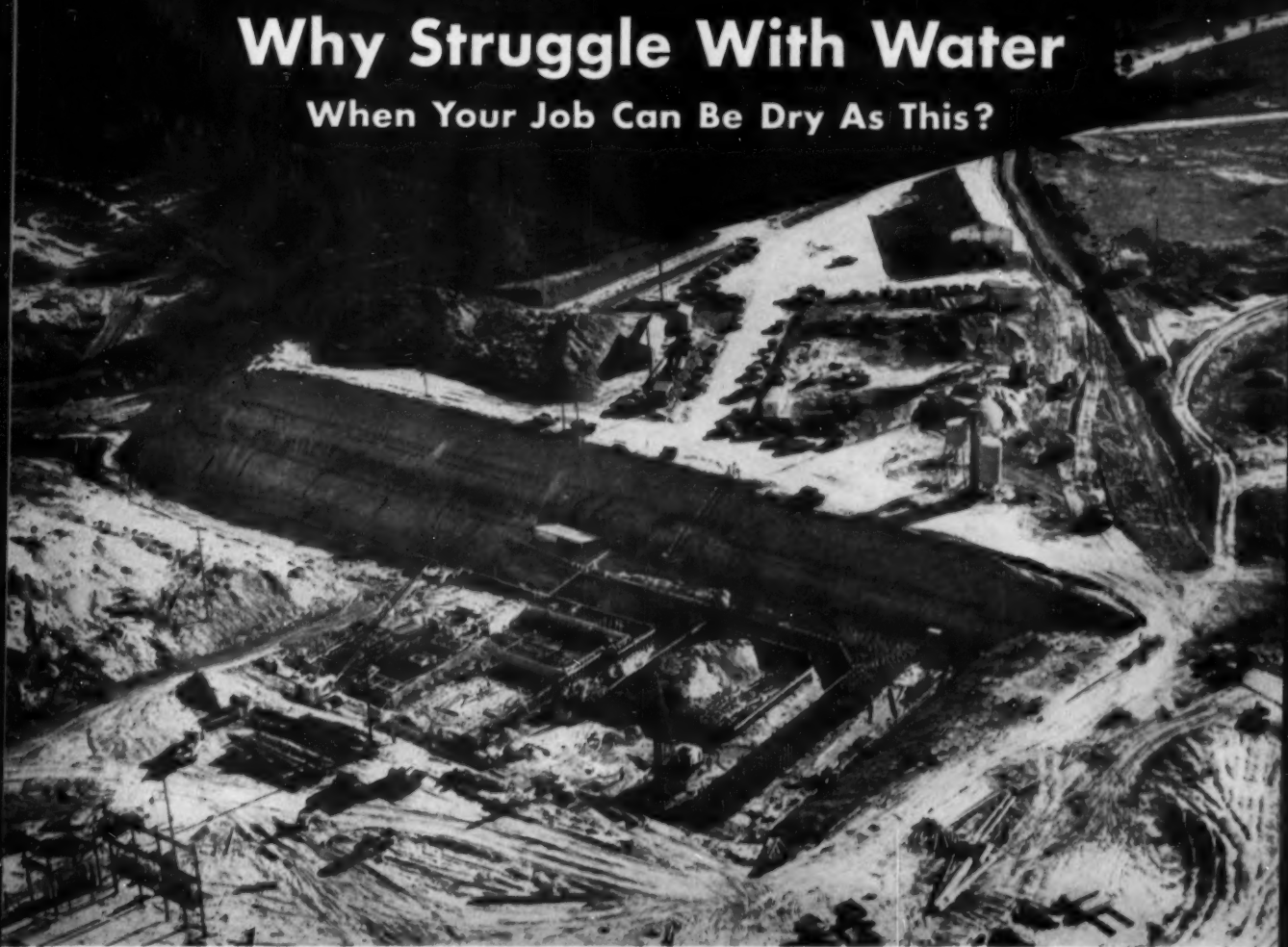
Spoil Becomes Aggregate

Three Foden 12-yd rear dumps, and seven Fordson 7-yd rear dumps are transporting the spoil to a stock pile located about 3 mi from the quarry site. As the trucks leave the quarry, they pass over a 20-ton scale that weighs out the payload. An average of 700 tons a day is being removed.

The stone spoil is being processed by crushers and will be used as concrete aggregate. Farr will line the quarry with pre-cast concrete panels to make it suitable for underground storage. The contractor also will blast out a steeply graded access road from the surface to the storage area.

Why Struggle With Water

When Your Job Can Be Dry As This?



Pumping Contractors: American Dewatering Corp., New York, Houston, Texas

The economic importance of getting a wet job off to a good dry start is thoroughly understood by Mississippi Power Co., Gulfport, Miss. Faced with the problem of handling 23' of water in clay, sand and silt on this deep power plant foundation, they lost no time in installing a dependable MORETRENCH WELLPOINT SYSTEM which:

1. Immediately gave them a workable dry job.
2. Permitted excavation and related work to proceed according to schedule without interruption—in perfect safety.

A good start on any project is half the battle. On a wet one, it's a necessity! That's why successful contractors pump with MORETRENCH.

For full information, contact our nearest office.
Rentals, sales, contracts.

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Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Brazilian Representative: Oscar Taves & Co., Ltd., Rio de Janeiro



Only 3 Walers Used with Symons Forms on 16' High Wall

Henry Carlson Construction Company, Sioux Falls, South Dakota, used only 3 walers with Symons Forms on 16' high 12" thick wall for City Water Treatment Plant, Sioux Falls. 10,000 square feet of Symons Panels were reused 12 times on the job, resulting in considerable saving of labor, material and a fast forming schedule.

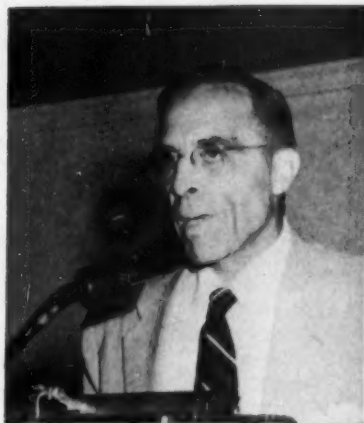
To make it easier to pour these high walls certain of the upper panels were, at regular intervals, raised 1 foot to permit pouring through side openings for the first 8 feet of concrete. This avoided dropping concrete from the top.

Send the plans for your next job and our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient

and cost saving method of forming—no obligation. Symons Forms, Clamps and Shores can be rented with purchase option.

Catalogs and additional information on Forms—Clamps—Shores sent on request. Symons Clamp & Mfg. Co., 4255 Diversey Avenue, Dept. K-6, Chicago 39, Illinois.

Construction Men in the News . . .



AGC Names New Officers

LESTER C. ROGERS (left) of Bates & Rogers Construction Corp., Chicago, and FRED W. HELDENFELS, JR. of Heldenfels Bros., Corpus Christi, are respectively new presidential and vice presidential nominees of the Associated General Contractors of America.

Rogers will succeed Frank J. Rooney as president. They were nominated at the mid-year meeting in Milwaukee of the AGC's advisory and governing boards. Balloting will be by mail, and the new officers will be installed early in 1957.



PETER O. MATTEI (left) and J. PAUL OPPENHEIM will be operating heads of the newly organized Bishop-Mattei Construction Co. of San Francisco, Calif. The firm recently was created through a merger of Peter O. Mattei Construction Co. and Bishop, Younger, Bradley Co., both of San Francisco. Frank C. Bishop of the Bishop,

Younger, Bradley Co. will serve as president of the new firm. Mattei, as vice president will be in charge of contract negotiations, and Oppenheim, as vice president and general manager, will be in charge of all construction. Neither of Bishop's former partners joined the new company. Jack Younger joined a brother, Don, to set up

Younger Bros., Inc., Builders, in Reno.

Mattei began engineering studies before World War II at Stanford University. After a stint with the U.S. Navy Air Force, he returned to the University of California where he earned B.A. and M.A. degrees in architecture.

In 1949 he formed his own contracting firm in Berkeley where his operations ranged from residential building to commercial and industrial work. He moved his firm to San Francisco four years later.

Oppenheim holds a B.A. from Cornell University and a Bachelor of Architecture degree from Columbia. As general manager of Bishop, Younger, Bradley, he supervised a number of the firm's heavy construction projects. Before that job, he was associated for several years as a partner in a Fresno construction firm.

The new firm will not become active until the two companies figuring in the merger complete earlier contractual commitments. The new company hopes to take on larger-scale projects than the member companies were able to take separately.

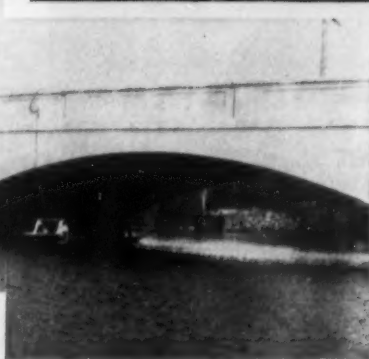
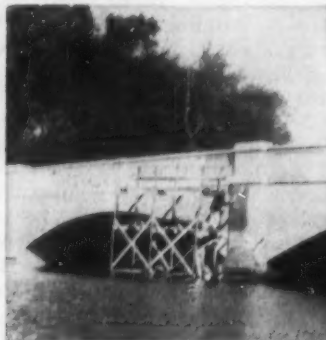
A. J. PADDOCK succeeds Norman B. Obbard as President of American Bridge Division, United States Steel Corp. Obbard becomes an Assistant Executive Vice President—Operations at U.S. Steel.

Paddock joined American Bridge as a time-keeper in the erecting department in 1929 and was transferred to the drafting department in 1930. Two years later he became plant rate clerk and industrial engineer. Appointed assistant to the manager of the Elmira plant in 1934, he advanced in 1937 to plant manager. In 1941 he was transferred to the Gary plant where he was manager for five years. In 1946 he was appointed vice president in charge of manufacturing operations and in 1954 became vice president in charge of contracting. He holds a civil engineering degree from the University of Michigan.

FRED I. ROWE is the new Chairman of the Construction and Civic

It's New Again with THORITE and THOROSEAL

Freeze-thaw cycle following water and moisture penetration, also swelling of reinforcing rods from moisture contact, cause masonry destruction.



BRIDGE OVER CONCORD RIVER
ROUTE 3, BELLERICA, MASS.



Workmen on scaffold patch spalled and cracked concrete with THORITE and seal surface with THOROSEAL.



Area at left chipped to sound masonry. It will then be patched with THORITE Nonshrink, Non-slump 20-Minute Set Patching Mortar, without necessity of costly forming, finished by application of Thoroseal.

Request Circular No. 16 and 20.

Write for our 16 page
"How to Do It"



STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA • CENTERVILLE, INDIANA

MEN IN NEWS . . . Continued

Development Department Committee of the National Chamber of Commerce for 1956-57. Rowe, a partner and general manager of W. L. Johnson Construction Co and Associates of Columbus, Ohio, will direct the committee which deals with the over-all improvement of cities and development of construction markets.



STEPHEN H. MEEM has been named managing director of the new Engineering and Research Division of the American Road Builders' Association.

Meem will direct work aimed at promoting practical application of research findings to improve construction and maintenance methods. He will step up the flow of information to the ARBA membership on the use of new engineering techniques in design and construction of roads and in the use of new electronic devices. He will also take over the publication of more frequent ARBA technical bulletins and prepare special reports of interest to the highway industry.

Meem is a graduate of Virginia Military Institute with a B.S. in Civil Engineering. Until recently, he was assistant general manager of the Richmond-Petersburg Turnpike Authority and has served with the Road Commission of West Virginia and worked on many large commercial and industrial projects.

ARBA also appointed a new committee on photogrammetry to be headed by William C. Cude, chief of the Army Topographic Engineering Department, the Engineer Research and Development Laboratories, Ft. Belvoir, Va. Cude is president of the American Society of Photogrammetry.



All-wheel traction. With the extra traction of its 4-wheel drive, the 'Jeep' Truck is an all-purpose, performance-proved workhorse for moving men, tools and equipment to or around construction sites. It carries more than a ton of payload, on the road or off—in low-low gear climbs grades as steep as 60°, fully loaded—tows heavily-loaded trailers where other vehicles can't go.

Contractors save time and manpower with 'Jeep' versatility and all-wheel traction!



Transportation. The 4-Wheel-Drive Universal 'Jeep' is always on-the-go—whether carrying engineers for initial surveys, speeding men, equipment and tools to construction assignments, or providing transportation for final inspection work.



Mobile power. Taking power to the job, on-the-road or off, is simplified with a rugged 4-Wheel-Drive 'Jeep' Truck equipped with power take-off and crane, or other specialized equipment. It also operates welders, compressors and generators.

In every phase of construction, whether travelling through deep fill with men and tools, or operating earthmoving equipment, 4-Wheel-Drive 'Jeep' vehicles save time and manpower, help keep work on schedule every day of the year, good weather or bad.

These time-tested rugged vehicles provide a mobility and range of performance that is unmatched. The extra traction of their 4-wheel drive provides the go-anywhere power that keeps tough jobs moving. 'Jeep' vehicles go where other vehicles can't in the heavy, rough going of the construction project. Then, on the highway, a flick of the selector lever shifts them into conventional 2-wheel drive for travel at top legal speeds. With power take-off or hydraulic lift, they provide on-the-spot power to operate many types of equipment from dozer blades to back hoes.

Economical 'Jeep' vehicles supplement heavy-duty equipment, spread their cost over a wide variety of jobs, give you additional savings through long life and low maintenance costs. Ask your Willys dealer for a practical, on-the-job demonstration.

The **'Jeep'**
family of 4-wheel drive vehicles

WILLYS... makers of the world's most useful vehicles

WILLYS MOTORS, INC., TOLEDO 1, OHIO



Photo and Report by Interstate Industrial Reporting Service

Georgia red clay — often studded with quartz and granite — "routine" for Cleveland owner

CONCRETE CONSTRUCTION CO. of Atlanta, Georgia, recently completed a trench excavating job for the installation of a gas main in the North Druid Hills near Atlanta. "This area," says a report from C. V. Lanier, field superintendent for Concrete Construction, "contains quartz and—since the spine of Stone Mountain underlies the district—chunks of granite. But, using one of our Cleveland 95's, we consider it just a routine job." Concrete Construction currently

operates nine Cleverlands, three 92's, four 95's and two 110's. Mr. Lanier's report continues:

"Trencher operations constitute the basis of our business—and to us that means Cleverlands. Mechanically, we have never had a Cleveland halt in the field."

Performance like this proves again that Cleverlands dig *more trench . . . in more places . . . at less cost.* Talk it over with your Cleveland distributor.



Good



Everywhere

THE CLEVELAND TRENCHER COMPANY

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

The Maintenance Shop . . .



WELDER APPLIES Stoody 121 fabricated hardfacing wire to sheepsfoot tamper boot held in carbon mold. Cast-weld technique and semi-automatic equipment triples his output.



CAST-WELDING allows metal to be deposited where gage is most important.

Mold Speeds Boot Hardfacing

IT DOESN'T seem possible that several thousand dollars a year can be saved on such a routine job as rebuilding sheepsfoot tamper boots, but that's what J. A. Thompson and Son, Inglewood, Cal., contractors, expect to save this year, thanks to a new hardfacing process.

The new technique was devised by Dave Moodie, Thompson's master mechanic, because boot maintenance was taking up too much of his welders' valuable time. His idea not only solves this problem, but it also reduces new parts costs and doubles the life of reconditioned boots. When you realize that Thompson operates 24 compactors with a total of more than 5,000 boots that were rebuilt every six months, it is easy to see that savings in time and money are substantial.

Moodie's new method, which combines the best of several hardfacing techniques, is essentially a weld-casting process that utilizes a carbon mold and semi-automatic welding equipment. Moodie fabricated a graphite-type split mold so that it outlines the contour of a new tamper boot. When worn

boots come into his shop they are placed face up in the mold. The mold is held together with a C-clamp.

The tamper boots are hardfaced with Stoody 121 fabricated hardfacing wire applied through either of Thompson's two semi-automatic welders, a Lincoln 400-amp shield arc unit or a MagnaWelder auto arc welder. On the average, it takes about $\frac{3}{4}$ lb of Stoody 121 to restore the original contour of a worn boot.

The technique offers several important advantages. The mold not only shapes the welding puddle properly, but it also serves as a gage to indicate the correct length without measuring each boot against the other. This makes it much easier to rebuild the boots uniformly, and less-experienced personnel can do the job with accuracy.

Because the mold sees to it that the weld metal is deposited where it is needed most—along the perimeter where gage is critical and wear extreme—the cast-welded boot holds its size much longer than boots that are mechanically hard-



JOB-BUILT split mold, held together with C-clamp, outlines boot's original contour.

News about CONCRETE FINISHING



Here is a really smooth finishing job done on a super market floor with the STOW G-34 Roto-Trowel. Note that the operator was able to trowel right up to the walls, because of the rugged, stationary guard ring. According to men in the field, the new STOW trowel is the most advanced, best engineered trowel on the market; and it makes possible extremely smooth surfaces.

The STOW G-34 Roto-Trowel handles easily. It has many important safety features, such as the foolproof, dead-man clutch control that stops blade rotation the instant the operator releases the handle. The engine remains running, thus eliminating the necessity of re-starting the engine. For complete information about the complete line of STOW Roto-Trowels, write today!



46" Roto-Trowel 34" Roto-Trowel New 24" Roto-Trowel

SPECIFICATIONS

Model No.	Trowel Diameter	Ring Diameter	Engine	Trowel Speed	Float Trowels	Finish Trowels	Operating Weight
G-24	24"	25"	Briggs & Stratton 2.2 HP	35 to 120 RPM	6" x 10"		69 lbs.
G-34	34"	35"	Briggs & Stratton 2.5 HP	25 to 100 RPM	10 x 14"	6" x 14"	145 lbs.
E-34	34"	35"	G.E. Fan-Cooled 1 1/2 HP	90 RPM	10 x 14"	6" x 14"	139 lbs.
G-46	46"	48.5"	Wisconsin - BEN 6.8 HP	25 to 100 RPM	10 x 18"	6 x 18"	212 lbs.

STOW

STOW MANUFACTURING CO.

31 SHEAR STREET, BINGHAMTON, N. Y.

MAINTENANCE SHOP... continued



CLOSE-UP of reconditioned boots after four months' service shows they have held gage.

faced. Another important consideration is that cast-welded boots are not as likely to wear to a point where they are beyond repair. This means quite a saving because it reduces the number of new replacement boots.

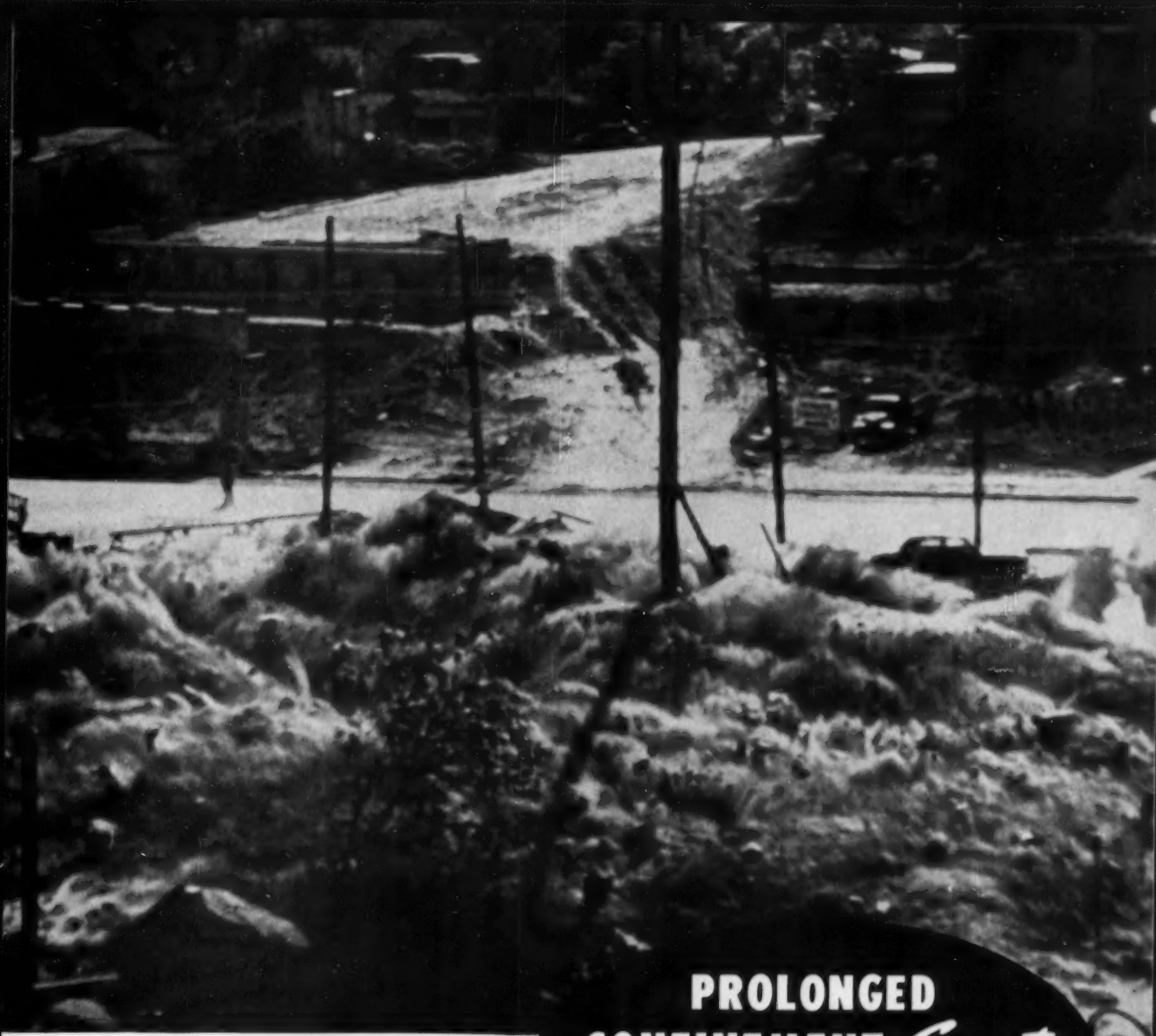
Triples Welder's Output

A worn boot is salvaged for about \$1.25 with the cast-weld technique, and this figure includes all labor costs. This is about 45% less than the price of a new boot and the cost of its initial hardfacing. New boots are hardfaced in a criss-cross pattern before they are installed on the roller.

Using Thompson's previous hardfacing method, a welder was doing well if he rebuilt 20 boots in an 8-hr shift. With the new technique, welders are averaging about 80 rebuilt boots per shift, and the job is a much less tedious one than it was before.

The speed of the weld-casting process also has eliminated another bad practice that Thompson sometimes had to follow. When a welder's schedule was heavy, tamps were often put into service without any protection at all. This seldom happens now.

Rebuilt boots are given a rough test when they are returned to the roller. Installation is handled with a 12-lb sledge, and the theory is that if the weld metal holds up under the impact of the sledge when it is being seated on the roller, then it will hold up well in the field.



Blast initiated at bottom of holes using ROCKMASTER millisecond delays in an alternate pattern. Prolonged confinement keeps explosives force working on burden . . . breaking rock. Entire mass lifted only few feet.

PROLONGED CONFINEMENT *Counts*

when the public
is watching and listening

When you're blasting along Central Avenue, the eyes and ears of all Yonkers are on you. Using the ROCKMASTER method with its *prolonged confinement* of explosives force, Yonkers Contracting Co. and Corbetta Construction Co. got good breakage and good public relations in all their blasting.

Prolonged confinement counts! The right combination of ROCKMASTER millisecond delay electric blasting caps and Atlas explosives makes possible—

- good control
- greater efficiency
- improved breakage
- better public relations

Before your next blast, why not go over your *specific* problems with your Atlas representative? He'll help

you get the most out of the ROCKMASTER method and your explosives. And get "Better Blasting"—Atlas' informative newsletter on latest methods and materials. Write us to put your name on our mailing list today.



EXPLOSIVES
DIVISION

ATLAS

POWDER COMPANY

WILMINGTON 99, DELAWARE

offices in principal cities

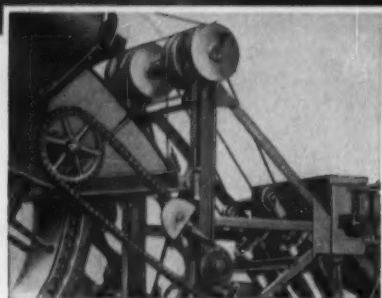
NOW!

Instant Hydraulic Control of Conveyor Speed and Direction

Only

**Gar Wood
Buckeye**

has it!



LIVE HYDRAULIC WHEEL HOIST, TOO!

Positions digging wheel faster, more accurately. Independent of all other operations. Operated from the seat by simple, one-hand controls.

Live hydraulics in new job-proved Buckeye ditchers make conveyor control far easier and faster than ever before. From the seat, the operator merely touches a lever for instant conveyor adjustment to handle any volume of spoil. Three discharge speeds in either direction meet every conveyor need. And, Gar Wood's exclusive hydraulic conveyor drive is completely independent of any other function. No complicated shifting . . . no need to stop digging wheel or crawlers. Maintenance is easier, too. No complicated drive transmission to adjust and repair.

All three of these new Gar Wood-Buckeye models—the 305, 307 and 308—have this and many other important features. For complete data and specifications, call your Gar Wood-Buckeye dealer or write direct to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.



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Excavators



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Winches



Gar Wood-Buckeye
Finegraders



Gar Wood-Buckeye
Ditchers



Gar Wood-St. Paul
Hoists & Bodies

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributors

Pioneer Engineering Works, Inc.: The Atlantic Tug and Equipment Co., Inc., of Syracuse, N.Y., has been appointed distributor for northeast New York State. Gordon Henry is general manager of Pioneer's new distributorship.

LeTourneau - Westinghouse Co.: Contractors Equipment and Truck Co., Inc., of Lexington, Ky., has been appointed Kentucky distributor for the complete line of LeTourneau - Westinghouse equipment including the motor graders and TraveLoaders manufactured by its Adams Div. Tom Catlett is president of the new distributorship.

Koehring Co.: The Jaeger-Lembo Machine Corp. of Springfield, N.J., has been appointed exclusive distributor for Koehring and Parsons construction equipment in Northern New Jersey. John S. McBryde Co., Inc., of Washington, D.C., has been named distributor for Koehring's subsidiary, the Kwik-Mix Co., on a non-exclusive basis. Other Kwik-Mix Co. distributors recently named are the Equipment Repair and Supply Co. of Melrose Park, Ill., who will cover several counties in Illinois and Indiana; the Cactus Equipment Co. of Houston, Texas, who will represent Kwik-Mix in southeastern Texas; and the Tom Wood Truck Equipment Co., Inc., of Miami, Fla., who will handle 12 counties in southern Florida.

On the Sales Front

GMC Truck and Coach Div.: R. H. Gillespie has been appointed fleet sales manager and will direct an expanded fleet sales program from GMC's home office at Pontiac, Mich. He was formerly eastern regional manager.

(Continued on next page)



Wherever There's Hose ... You'll Find PUNCH-LOK HOSE CLAMPS

Why so popular? In one sentence: **not one failure!** Punch-Lok clamps last for the life of the hose. There are handy clamping tools for putting them on with the precise tension desired. It takes only seconds to do the job. No wear. No tear. No leak. No snag. Used in industry—everywhere.

Write for Descriptive Literature
or See Your Nearby PUNCH-LOK Distributor



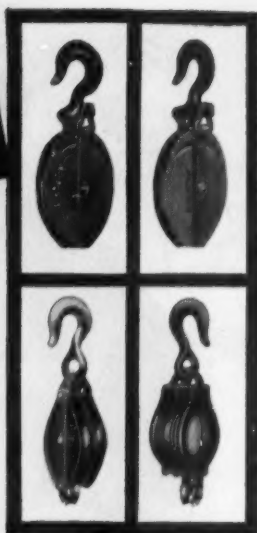
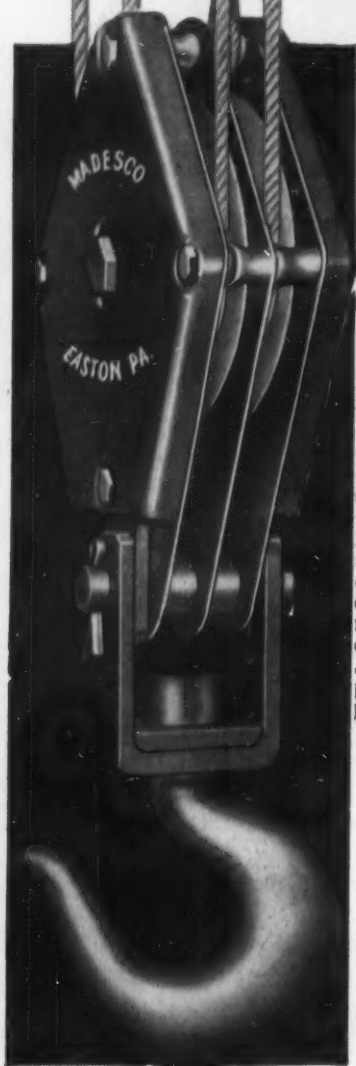
"The Sign of a GOOD Hose Clamp"

PUNCH-LOK
Company

0430

Dept. F, 321 North Justine Street, Chicago 7, Illinois

**Performance-Proved
TACKLE BLOCKS
For Every Lifting Purpose**



CORRECTLY ENGINEERED

Safe, fast lifting, plus long rope-life are factors largely determined by the suitability of the block you use on a specific job. A wide variety of standard in-stock MADESCO blocks, and/or individualized MADESCO engineering services, assures you top lifting efficiency even under the most difficult conditions. MADESCO performance-features reflect more than 30 years experience in almost every industry . . . an experience in which you can place your confidence . . . an experience that can save you money.

A COMPLETE LINE

FOR QUICK DELIVERY

PLUS SPECIAL BLOCKS

HAE-MA-106/2-56

WORTH ASKING FOR—BY NAME

**MADESCO
BLOCKS**

Check the many exclusive Madesco features and you'll wisely refuse substitutes.

MADESCO TACKLE BLOCK CO., Easton, Pa.

HAE-MA-184-156

SALES AND SERVICE...

continued

Euclid Div. GMC: J. W. Bloomquist, domestic sales manager, has announced the appointment of L. H. "Rip" Brannan as a district sales representative in the central region, which includes North and South Dakota and the province of Manitoba, Canada. His office is in Fargo, N.D.

Prime-Mover Co.: Jack L. Nichols, formerly district representative for the Findlay Div. of Gar Wood Industries, has been named district representative for Pennsylvania, Maryland, Washington, D.C., Virginia, West Virginia, New Jersey, New York, the New England states, Ontario, Quebec and Nova Scotia.

Pioneer Engineering Works, Inc.: Fred W. Hartlage has been appointed sales promotion manager for Pioneer, a subsidiary of Poor & Co., Chicago, Ill. Hartlage was formerly an account executive with the Alfred Colle advertising agency and advertising and sales promotion manager of Baker-Lull.

In the Main Office

Littleford Bros., Inc.: William T. Camm, formerly Littleford's plant and industrial engineer, has been named chief of the design and development department at the new research and development center for black top road construction and maintenance equipment. T. J. Grueter has been made a design and development engineer at the center.

Dodge Mfg. Corp.: Carl W. Petersen, previously vice president and works manager, has been elected executive vice president. Other recent executive appointments include Earl Wedlake, vice president in charge of production and purchasing; and Karl D. Jahnke, secretary and treasurer.

Blaw-Knox Co.: A. H. Jackson, manager of the equipment division's engineering and development department, has been appointed vice president-general manager of the equipment division plant at Blawnox, Pa.

Macwhyte Co.: Goodwin Johnston, secretary and treasurer, has been appointed to the newly created position of director of purchases.

(Continued on page 161)

"Sonny" Caravello (right), Greco Supervising Foreman, and Standard automotive lubrication specialist, Tom Farrell, go over Greco lube requirements. Tom Farrell has an engineering degree and has completed the Standard Oil Sales Engineering School. He has been providing lubrication technical service to Standard Oil customers for six years. Customers find Tom's experience and training pay off for them.

Greco Contractors, Inc. "moves the earth"

STANOLUBE S-1 Motor Oil helps keep Greco's equipment on the move

A lot of dirt in greater Chicago has been pushed around and hauled out of the way by Greco Contractors, Inc. One of the big projects on which Greco is now making the dirt fly is Chicago's Congress Street Superhighway. Greco dirt hauling trucks and dozers and shovels use STANOLUBE S-1 Motor Oil. There are good reasons why.

Moving dirt is a dirty job. Greco has neither time nor opportunity to baby equipment. Greco has a first rate maintenance system in operation and top servicing facilities but to meet schedules, dozers, shovels and trucks have to work hard and at top speed. This places a heavy burden on the motor oil. A motor oil that can't stand up to this kind of service breaks down. Heavy deposits build up on pistons and rings and the rings stick. STANOLUBE S-1 Motor Oil is specifically manufactured to eliminate the adverse deposits resulting from severe service conditions such as are imposed on Greco's equipment.

The job STANOLUBE S-1 is doing for Greco Contractors, Inc. by helping keep equipment moving earth, can also be done for you. Find out. Check with your Standard Oil automotive lubrication specialist in any of the 15 Midwest and Rocky Mountain states. Or write, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Quick Facts About STANOLUBE S-1 Motor Oil

- 1 Special heavy duty oil developed to meet unusually severe engine operating conditions.
- 2 Provides effective lubrication for automotive diesel engines even when using high sulfur fuels.
- 3 Manufactured from high quality "center cut" base stock.
- 4 Detergent-dispersant additives control deposits on pistons and rings.
- 5 Oxidation and bearing corrosion inhibitor additives prevent formation of excessive varnish and sludge; prevent corrosion of bearing metals.



Jim Phelps, Standard Oil automotive lube specialist joins Tom Farrell in assisting Greco men with lube problems. Jim has 29 years experience with Standard—aviation as well as automotive. Here Jim discusses maintenance with Greco equipment foreman Tony Guerino.

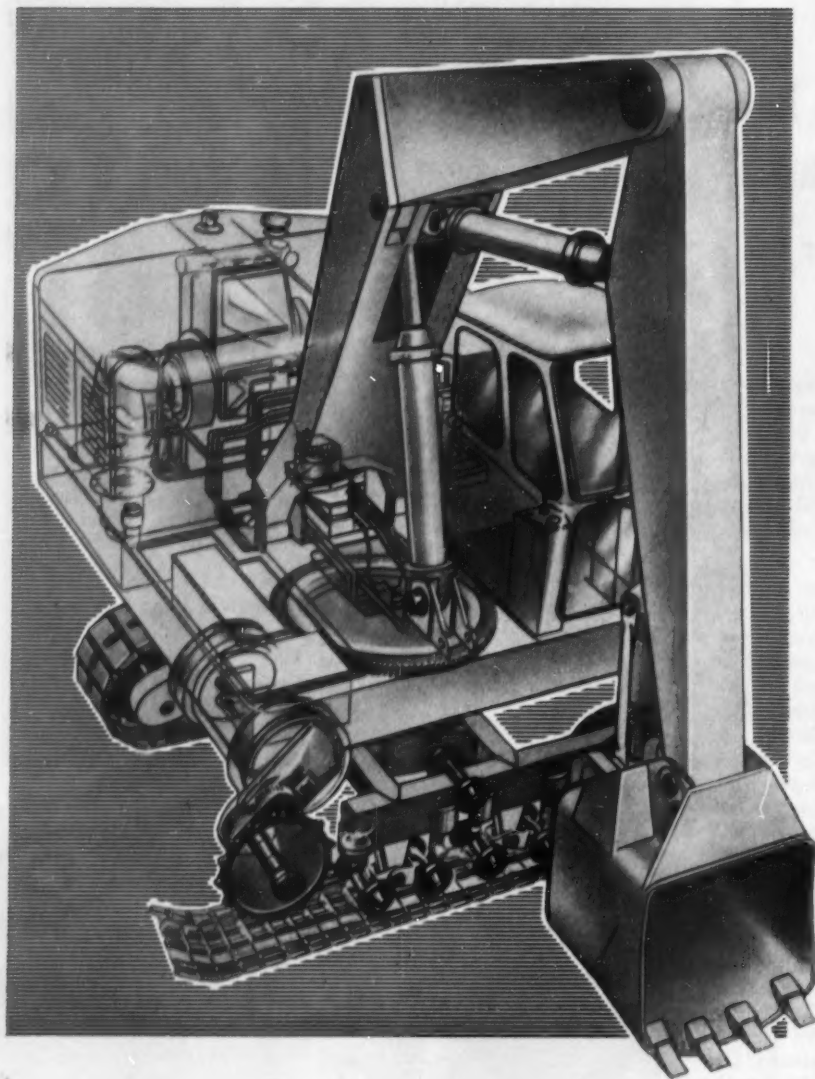


Mack and White trucks, both gasoline and diesel, comprise the largest portion of Greco's dirt hauling fleet. Sonny Caravello (left) and Standard's Tom Farrell here talk over lube matters beside A-55 Mack Diesel.

STANDARD OIL COMPANY
(Indiana)



THIS EXCAVATOR DOES YOUR BRAIN WORK!



It is really true,

that at the All Hydraulic Excavator B 504, the digging forces and working speeds are automatically adapted to ground resistance. The digging force remains constant throughout the operating range, due to the favourable kinematic. No power loss!

The B 504 is a big time saver

and production booster! Increased outputs of up to 40% have been recorded. The digging tools have a capacity of $\frac{1}{2}$ cu yd; special requirements with buckets up to 1 cu yd can be met. Engine rating is 42 hp.

Big savings in equipment maintenance will be realized

Forget about intricate mechanical transmission elements, such as ropes, drums, brakes, and clutches. Hydraulic power, generated by a simple system of hydraulic pumps, motors, and cylinders does the job.

You ought to get all the details about the B 504 to-day!

VOLLHYDRAULIK-BAGGER

B504

DEMAG-BAGGERFABRIK GMBH

DÜSSELDORF-BENRATH

SALES AND SERVICE...

continued

In addition to his corporate duties, Johnson will direct the buying of raw materials, supplies, capital equipment, and office equipment.

Yuba Mfg. Co.: W. P. Blanchard has been elected vice-president and general manager of Yuba. Formerly secretary and treasurer, Blanchard will now direct the operations of Yuba's San Francisco plant, as well as the operations of the C & D Movall division at Perkins, Cal.

Pioneer Engineering Works, Inc.: W. A. Rundquist has been elected vice president for sales promotion, it was announced by O. J. Ellertson, Pioneer president. Rundquist is also director of advertising and public relations for the parent company, Poor & Co., Chicago. He has been in charge of advertising and sales promotion activities for Pioneer since 1945. During the war he was an officer with the U.S. Army Engineers.

Special Mention

J. I. Case Co.: The boards of directors of Case and the American Tractor Corp. recently approved plans for a merger that would give Case an entry into the crawler tractor field. The merger will be submitted to stockholders of both companies as soon as details are completed. American Tractor Corp. started manufacturing in 1950 and increased its volume by some 400% in the past two years. The 114-yr-old J. I. Case Co is one of the country's major manufacturers of rubber-tired tractors and farm machinery. The merged companies will operate as the J. I. Case Co. No major changes in personnel are contemplated, except that Marc B. Rojzman, president of American Tractor, will occupy the newly created position of executive vice president and general manager. Production will continue at the Case plants and at the recently expanded Churubusco, Ind., plant of American Tractor.

Caterpillar Tractor Co.: A new parts depot will be opened near Miami, Fla., to provide emergency parts service for south Florida and export dealers. Bids for construction of a 50,000 sq ft building and outside storage slab will be taken in the near future.



This Jaeger pumps all the water a 2" hose can handle



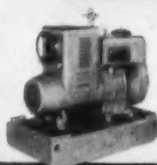
Hi-performance Jaeger Model 2PN will actually pump all the water that can be pulled through a 2" suction line under average working conditions. Delivers 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm below the speeds of similar ordinary pumps). Weighs only 160 lbs. on base, 190 lbs. on pneumatics. For complete information on this model or other Jaeger pumps, see your Jaeger distributor or send for Catalog P-4.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue
Columbus 16, Ohio

LOADERS • COMPRESSORS • MIXERS • PAVING MACHINES

HOBART welders



Lightweight
"HUSKY BOY"
air cooled
DC Welder



Popular
250 amp.
"Contractor
Special"

speed construction CUT COSTS!



Standard gas drive
DC Welders in
300, 400 and 600 amp. sizes

Do your own welding with your own men right on the job. Saves hundreds on repair work and building construction. Makes you independent of power lines for operating your own equipment. New Simplified Controls make welder easy to use and avoid costly tear-downs, delays and expensive replacement parts. You'll find the new Hobart your most valuable tool. See and try the Hobart Welder and you'll quickly understand why leading industries everywhere are so enthusiastic about these modern arc welders.

• To HOBART BROTHERS CO., BOX 6104, Troy, Ohio
Without obligation, send complete information on the equipment I've checked below.

☐ amp. capacity ☐ "Contractor Special" ☐ "Husky Boy" air cooled ☐ Standard gas drive

NAME _____ POSITION _____

FIRM _____

ADDRESS _____

Use the coupon
no obligation

More Work-ability with

The simple, practical design of these "Euc" Scrapers with capacities of 7 and 12 yards struck is years ahead of the field. It brings you a new high in scraper performance and low cost yardage that has made Euclid the fastest growing scraper line in the industry.

Hydraulically controlled lever action provides fast, positive and independent operation of bowl, apron and ejector. Down time and delays caused by cable breakage are completely eliminated. All major components and the entire power train are readily accessible for easy servicing and maintenance.

Have your Euclid Dealer give you facts and figures on the S-7 and S-12 so you can compare them with your present equipment . . . you'll find that *Euclids are your best investment.*

S-7



7 yds. struck . . . 8 yds. at 3:1 slope . . .
9 yds. heaped at 1:1 . . . 18.00 x 25 tires
with 21.00 x 25 optional . . . 143 h.p.
. . . NoSpin differential . . . non-stop
180° turn in 28 ft.



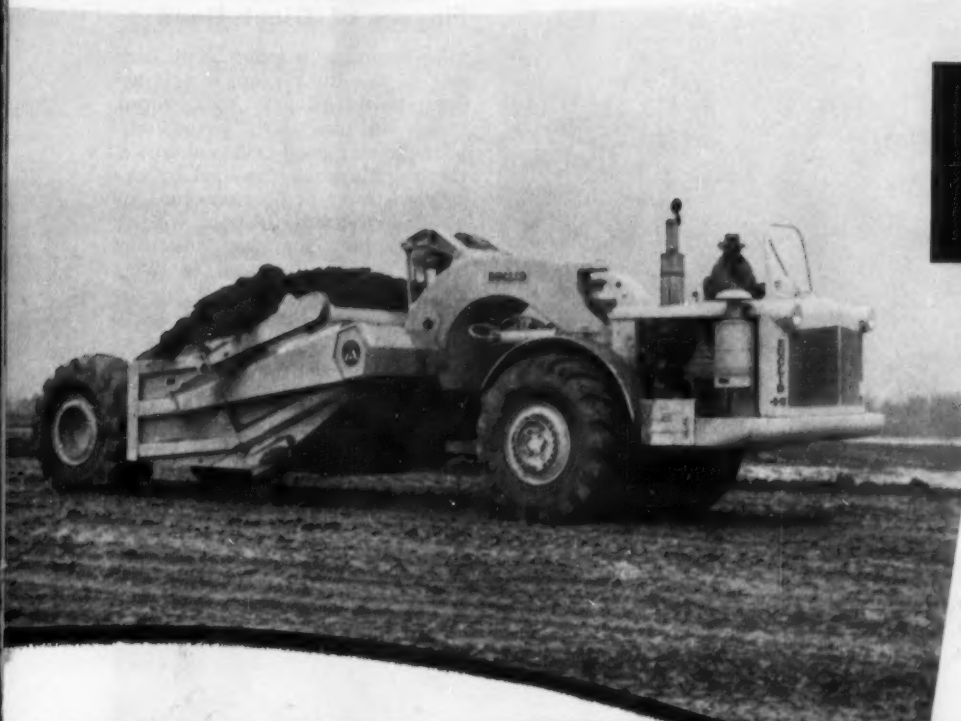
Easy maneuverability of the S-7 makes it a versatile earth-mover for a wide range of work. Full hydraulic steering permits non-stop turns in only 28 feet . . . enables the unit to get in and out of close quarters. Here a load of topsoil is being spread at a New Jersey housing project.



With its low, wide bowl and adjustable 4-section cutting blade, the S-7 is a fast, easy loader . . . picks up heaped loads without pusher assistance in good materials. This "Euc", equipped with cab, is working on a big land leveling project in the state of Washington.

S-7 and S-12

"EUC" Scrapers



12 yds. struck ...
14 yds. at 3:1 slope
... 16 yds. heaped
at 1:1 ... 26.5 x 25
tires ... 218 h.p. ...
9' 6" width of cut ...
NoSpin differential
non-stop 180° turn
in 31 ft.



Big 26.5 x 25 tires, NoSpin differential, Euclid planetary drive axle and 218 h.p. engine give the S-12 plenty of power and traction to pick up heaped loads in a hurry. On this Tennessee highway job, the 28 mph top speed with capacity payloads was a big factor in maintaining high production at low cost.

Contractor preference
for "Euc" Scrapers
results from
pay-off performance
on the job.



Rugged construction of the S-12 keeps down time to a minimum—it's designed for work on the toughest jobs with big push tractors. Heaped loads of heavy clay—15 yds. and more—were picked up in a short travel distance on this South Carolina railroad grading project.

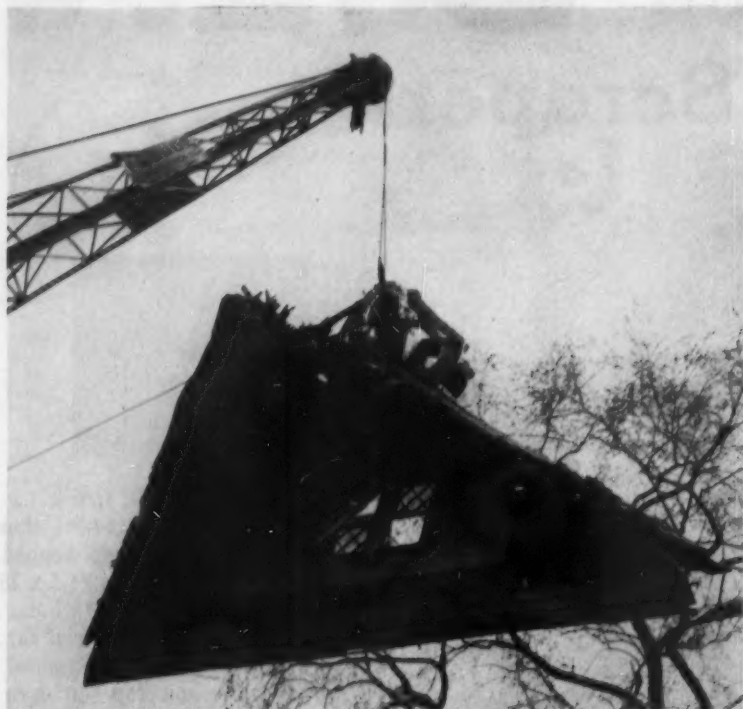


Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



Construction Equipment News ...



Grapple Operates Like Fingers of Giant Hand

Like fingers of a giant hand, each tine of the Ruhr grapple acts independently to grip rock, scrap, and other irregularly shaped objects. When a good grip is obtained, the grapple holds the load by exerting a force of up to 50 tons, or about five times its own weight. The grapple, ideal for demolition work, is manufactured in West Germany. It is available in the U.S. in capacities of from $\frac{1}{4}$ to $3 \frac{1}{3}$ yd, with either five, six or eight tines, depending on the size. Points of the tines are hardfaced to resist abrasion, and on the heavier models wear plates of manganese steel are provided for some applications.—**Ruhr Industries, 1411 Walnut St., Philadelphia 2, Pa.**



A Safe Ride Assured

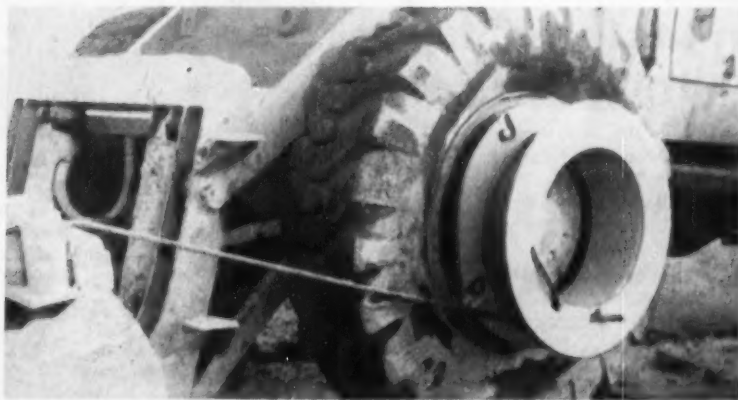
Lifting capacities of Ohio Cable Car hoists are limited only by motor power, and lifting heights are limited only by the length of cable used. Two electric hoists, an air-powered model, and a hand-operated model are available. Each is equipped with at least three load brakes that act independently of each other to assure safe operation.—**Ohio Hoist & Mfg. Co., Inc., 321 S. Beaver St., Lishon, Ohio.**

Turns in Own Length

Worthington's 34E dual drum paver incorporates 17 design modifications not available in previous models. Engine speed is increased from 1,400 rpm to nearly 1,800 rpm. Other changes include a four-strand chain drive, hydraulically operated steering brakes, and a 700-gal auxiliary water tank strengthened to prevent buckling or weld cracks. The hydraulic steering brakes, replacing mechanical brakes, enables the paver to turn within its own length.—**Worthington Corp., Harrison, N.J.**

Automatically Controls Slope of Grader Blade

Preco's automatic control for the Caterpillar No. 12 grader keeps the blade at any desired slope, no matter how the grader frame is affected by surface conditions. The unit, said to cut finishing time in half in some applications, will control the slope to within $\frac{1}{8}$ in. in 10 ft. The operator selects his slope by setting a dial calibrated for both percent and ratio of slope, and then handles only the depth of cut control. The slope will remain as selected. The automatic control can be overridden by the operator, or shut off, to permit manual operation. It is powered by the grader battery. The unit is installed next to the standard grader controls.—Caterpillar Tractor Co., Peoria, Ill.



Winch Mounts on Wheel

The Temac winch for four-wheel drive, front-end loaders utilizes the ability of the loader to raise the front wheels by lowering the bucket. With the front end off the ground, the wheel-mounted winch pulls the load toward the vehicle, which is anchored securely because the load transfers to the bucket edge. With winches on both front wheels, the load is divided equally. The winch holds 165 ft of $\frac{3}{4}$ -in. cable or 350 ft of $\frac{1}{4}$ -in. cable.—Temac, Dept 2616, Box 556, Libertyville, Ill.

Two New Payloaders

Hough introduces two new four-wheel drive, pneumatic-tired Payloader tractor-shovels. These are the model HH, with a payload capacity of $1\frac{3}{4}$ yd heaped and $1\frac{1}{3}$ yd struck; and the model HU, with a capacity of $1\frac{1}{3}$ yd heaped, one yd struck. Both models have Hough's new Paylomatic power-shift transmission, which allows all



Continued on next page



**If you can reach it,
you can fasten it
with *Ramset*®**

One-hand operation in awkward places is simple with a light RAMSET powder-actuated tool. It's ideal for ladder and scaffold work.

For anchoring to concrete or steel, the new DUO-JOBMASTER® sets 3/4" and 3/8" fasteners interchangeably—merely by switching barrels right on the job! Yet the tool does not change size or weight!

There's no need to exert physical power when you use RAMSET. Let the power charge do the work! No wires, no hose to drag or untangle. RAMSET is entirely self-contained.

Tough jobs are now easy with RAMSET. No more drilling, filling, plugging and bolting. RAMSET fasteners are set at the press of the trigger—have greater holding power than old-style methods.

Speed your production, make work easier for operators, cut your costs, get more dependable performance by using RAMSET whenever fastening to concrete, steel or other hard materials.

Write for free new catalog, ready for you now.

companion tool

Shure-Set
TRADEMARK

Babybrother to RAMSET, this hammer-in tool uses no cartridge, but makes your own hammer power more effective. For masonry, mortar joints, cinder block. Ask for literature.

Ramset Fastening System

WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION

12103-J BERE A ROAD

CLEVELAND 11, OHIO

EQUIPMENT NEWS . . . continued

shifts in both forward and reverse to be made without even slowing down. Both models are equipped with torque converters and heavy-duty planetary final drives. Power-transfer differentials are included to aid the effectiveness of the four-wheel drive feature by making it possible to automatically transfer additional torque to the wheel with the best footing when the unit is operated in soft earth. Other features include redesigned boom arms that aid pry-out of the load; 40-deg tip-back of the load at ground level; power steering, and power-brakes on all four wheels. Parts that need servicing, such as the battery and the oil reservoir, are easy to reach. The engine is readily accessible from either side because it is not covered by the boom, cylinders, or other structures. The hydraulic system is closed and pressure-controlled to keep out air and dirt.—**The Frank G. Hough Co., 706 7th Ave., Libertyville, Ill.**



HIGHER LIFT — Gondolas and high-sided trucks can now be loaded directly by Michigan tractor-shovels fitted with a new high-lift bucket. Designed for the Michigan model 175A tractor shovel, the new attachment increases the dumping height of the bucket by 3 ft 7 in. This raises the lower edge of the bucket to 12 ft 1 in. from the ground.—**Clark Equipment Co., Construction Machinery Div., Pipestone Rd., Benton Harbor, Mich.**

SAVES TIME—Linde X-7 Anti-Spatter is a new silicone-containing emulsion that cuts weld finishing time by eliminating chipping, grinding, and other cleanup operations. Applied to the spatter area before arc welding, Anti-Spatter forms a thin protective coat over the weld metal that prevents molten spatter from sticking. After the welding operation is completed,

If it's Performance and Service you want

THIS OIL'S GOT IT!



LAB CHECK



SPOT CHECK



Be sure with Pure

This is the lube—Purol H. D., the fleet-tested oil—that teams up with PURE specialized service to help fleet operators like yourself cut important money from operating expenses.

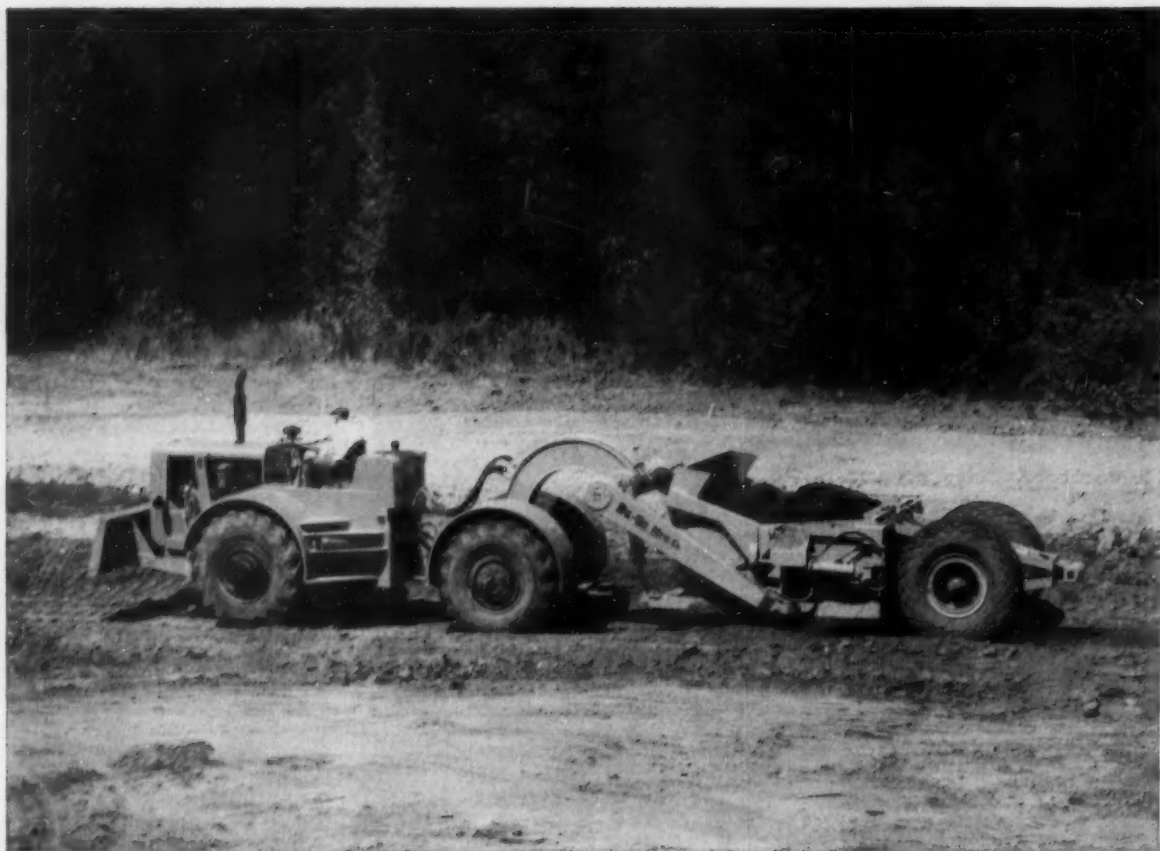
Purol H. D. is a rough, tough, friction-fighting heavy duty motor oil made especially for truck and tractor engine service. And here's what it does for you:

- Helps your engines deliver all of their horsepower because it keeps 'em clean and reduces friction.
- Provides more miles between overhauls with a tough film that cuts engine wear.
- Costs less to use because you add less Purol H. D. between changes.

Equally important, this great oil is supported by these free PURE services that are unequalled in the construction industry:

1. Pure-sure Lab Check Analysis on used oil in the PURE laboratories plus the PURE Spot Check you use on the job to determine proper oil change periods.
2. Simplified Lubrication Guide for Contractors' Machinery and Equipment.
3. Truck and Bus Lubrication Guide.
4. Pure-sure Preventive Maintenance Plan.
5. PURE Lubrication Engineering Service.

Get the full story fast on Purol H. D. and the PURE services that will help you by calling in your local Pure Oil representative today. It's the *sure* way to cut operating costs on all your jobs.



Wagner Model IND-14 Tractor equipped with Fuller R-96 ROADRANGER Transmission.

Wagner Earthmoving Tractors geared with **FULLER semi-automatic TRANSMISSIONS**

Sturdy Wagner IND-14 Tractors equipped with Fuller 10-speed R-96 Semi-Automatic ROADRANGER Transmissions handle tough construction

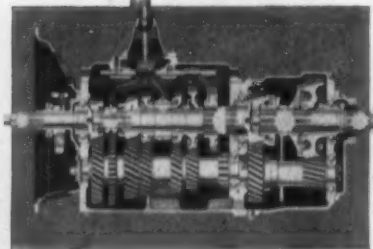
jobs. Above, a Wagner Tractor is shown pulling a Be-Ge Scraper, moving heavy loads with ease.

Easier shifting and faster acceleration are features that make Wagner Tractors equipped with Fuller Transmissions real time savers. The R-96 ROADRANGER makes work easier for engines of the 960 cubic inch class in off-highway construction applications

... the short, even steps between gear ratios keep the rpm in the maximum horsepower range.

There is no gear splitting ... the 10 selective ratios are evenly and progressively spaced, averaging short 28% steps. One shift lever controls all 10 forward speeds. Range shifts are pre-selected ... automatic and synchronized.

Fuller R-96 Semi-Automatic
ROADRANGER Transmission

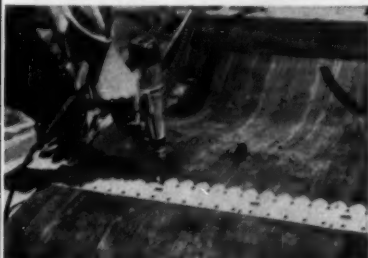


FULLER MANUFACTURING COMPANY
Transmission Division, Kalamazoo, Michigan

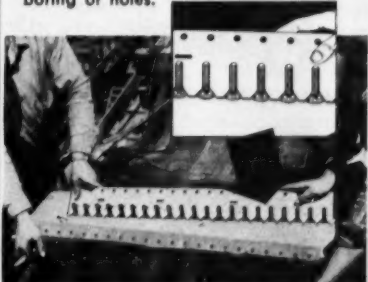
Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shaler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

NEW FLEXCO POWER TOOLS CUT APPLICATION TIME IN HALF

Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.



The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



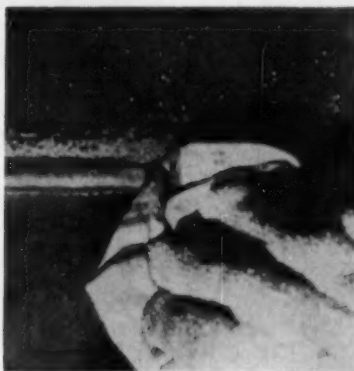
Running down nuts is fast with the new FLEXCO Power Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Power Tools from your local FLEXCO Distributor. Write for Bulletin F-112-A.

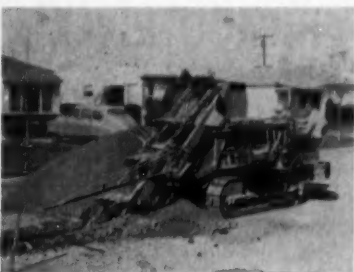
FLEXIBLE STEEL LACING CO.

4699 Lexington Street • Chicago 44, Illinois

EQUIPMENT NEWS . . . continued



the operator simply whisks away spatter with a cloth. The liquid is non-toxic, odorless and non-flammable and will not affect the weld. It costs less than one cent per sq ft of treated surface.—Linde Air Products Co., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N.Y.



DIGS DEEPER—Digging depth of the model 155 Trenchliner has been increased to 10 ft, a 25% increase over previous models. The change does not affect the Trenchliner's digging width range, which remains 16 through 26 in. The compact ladder-type trencher is only 7 ft 4 in. high and 5 ft 4 in. wide. Powered by either a gas or diesel engine, it has a range of 30 digging speeds that are selected by simple lever control. Features include a hydraulically actuated hoist on the telescopic boom, a reversible power-shift conveyor, self-cleaning crawlers, and a range of bucket sizes fitted with reversible teeth.—Parsons Co., Newton, Iowa.

DELIVERS 340 GPM—A new air operated sump pump manufactured by LeRoi is rated at 340 gpm against a 10-ft head. Features of the pump, which operates with a maximum head of 95 ft, include lightweight construction, low air consumption, a governor-controlled motor, and a built-in lubrication system. The pump requires no

WAREHOUSE GOING UP...



Contractor: John Cassidy Construction Co., Memphis, Tenn., and Paducah, Ky.
General Superintendent: Bill Barron
Forming: Gates Panel System

... Costs staying down with Gates

Warehouse construction drives home the many ways Gates Forming Systems save time and money on every job. For instance, use of a Gates Forming System on this 4' deep x 320' long spandrel beam paid off in definite, measurable savings.

One brace was used every eight feet on one side only...a savings of 75% of the bracing normally required for a spandrel beam. Labor costs were reduced 25%.

Gates Systems are efficient, versatile, uniform and practical...thoroughly researched and job-tested for better construction. Across the country, more and more jobs are getting done better, faster thanks to the speed and efficiency of Gates Systems.

Their benefits to architect, contractor and owner are many and great, and warrant consideration. For facts about other Gates System applications, large or small, contact your Gates Dealer. Remember, in commercial construction as well as residential, Gates Builds the Best... Better!

E 9/66

Gates & Sons, Inc.
80 S. Galapago St., Denver 23, Colorado



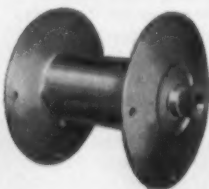
CARCO WINCH HELPS RESCUE 65-TON CRANE FROM CHICAGO RIVER

While working on a 15-degree slope, a 65-ton Bucyrus-Erie 51-B crane toppled into the Chicago River.

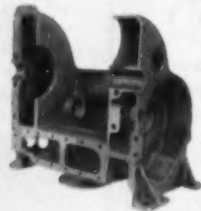
After careful investigation, States Improvement Company, the contractor, found that the easiest and cheapest way to rescue this valuable equipment from 21 feet of water was to winch it out.

Two lines fastened to deadman beams were run through snatch blocks and fastened by a diver to both front sides of the completely submerged crane. Most of the lateral pulling power was supplied by a Carco Model J winch on an Allis-Chalmers HD-21 tractor. Vertical lift was furnished by an Osgood crane and a sister 51-B. In six hours, the rescue was accomplished and the valuable B-E crane hauled to land without additional damage.

Emergency jobs of this kind demonstrate one important use of a Carco winch on construction projects. Others are heavy-duty towing, rescuing mired trucks and equipment, spotting and unloading freight cars, raising towers and poles, hoisting structural steel or timbers and other towing and hoisting jobs. See your nearest Carco dealer. **PACIFIC CAR AND FOUNDRY COMPANY**, Renton, Washington. Branch at Chicago, Illinois.



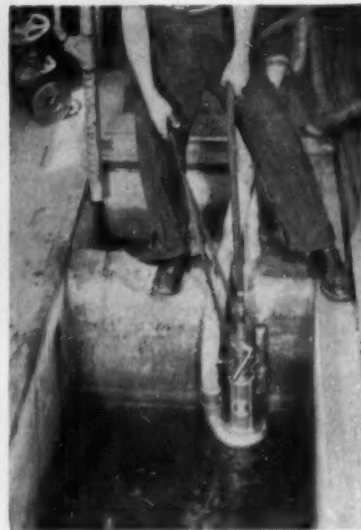
The Carco Model J winch is available with either Standard or High Capacity drum. The Standard drum (12" length) assures longer wire rope life. The High Capacity drum (14" length) has greater line capacity for utility service.



The one-piece Model J winch case is cast of patented Carcometal, a high strength alloy steel. It completely encloses all gears in a leak-proof oil reservoir and excludes water and dirt from the bearing races.

All Carco winches are built of the rugged materials needed to assure operating dependability. That's one reason why Carco makes more winches for more makes and models of industrial tractors than any other producer.

CARCO®



priming. It has a base dia of 8 in. and it is 23 in. high. The air inlet is 3/4-in. dia and the discharge outlet is 2 1/2 in. dia. Net weight of the steel model is 56 lb, and a 75-lb bronze model for handling acids or corrosive liquids is also available.

—LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.

TURBOCHARGED ENGINES —

Deutz air-cooled diesel engines with turbochargers are now available in this country. An eight-cylinder model with a bare engine rating of 210 hp at 2300 rpm weighs less than 2,000 lb. It has a bore and stroke of 4.38x5.5 and a displacement of 649.3 cu in. The other model is a 12-cylinder engine with a rating of 310 hp that weighs 2900 lb. In both cases, the bare engine rating includes the air cooling blower.—**Diesel Energy Corp.**, 82 Beaver St., New York, N. Y.

RETRACTS AUTOMATICALLY—

A new rock drill, which features automatic retraction of its integral pusher leg, has all its controls concentrated on the backhead so that the rig can be operated with one hand. Machine downtime for steel changes or positioning is held to a minimum by the automatic leg retraction feature. This is controlled by a handle grip and operated without shutting off the drill. In operation, the driller exerts pressure on the hand grip to release his feed pressure, and depresses the control to retract the stinger in the leg. Releasing hand pressure automatically stops re-



Here's how you can protect your equipment from winter's ravages with VISQUEEN film.

Store equipment outdoors in any weather! protect it with Visqueen® film



VISQUEEN film is the best moisture barrier under concrete floors.



You can't get a better curing blanket for concrete than VISQUEEN. Use it on floors, aprons, paving, roads.



Close openings with VISQUEEN film. Work in warm comfort during cold or stormy weather.

Storage sheds are no problem for alert operators who use heavy-gauge VISQUEEN film for all-weather protection. They save thousands of dollars every year by covering bulldozers, tractors, scrapers and other equipment and leaving it in a service yard.

VISQUEEN film protects pipes, lumber, concrete blocks, sacked concrete for out-

door storage—in fact it can be used to cover almost any construction material that might be damaged by water.

important! VISQUEEN film is all polyethylene, but not all polyethylene is VISQUEEN. Only VISQUEEN, produced by process of U.S. Patents No. 2461975 and 2632206, has the benefit of research and resources of The VISKING Corporation.

VisQueen®

film... a product of

THE VISKING CORPORATION, BOX CM10-1410
Plastics Division, Terre Haute, Indiana
World's largest producers of polyethylene sheeting and tubing
In Canada: VISKING Limited • Lindsay, Ontario
In England: British VISQUEEN Limited • Stevenage

Name _____

Title _____

Products _____

look for this name on the selvage!

VisQueen®

For complete details, clip this coupon and attach to your letterhead.



New Barber-Greene conveyor, erected in just 2 1/2 days after the fire, boosts tonnage from 250 tons a day to 250 tons per hour.

Conveyor destroyed by fire on Monday New one operating Friday

On Monday fire roared up a wooden conveyor owned and operated by a Milwaukee cement block company. Out of the devastation only the wooden "A" frames remained. Without the conveyor, production was at a standstill.

At 6:00 the following morning the owner called the local Barber-Greene distributor to see what could be done. Drawing from his own

stock of standardized conveyor components—trusses, idlers, drives—the distributor was able to rush all the necessary components to the burned out plant by noon. And by Friday morning the new conveyor was erected and operating.

This fire and the quick return to normal operations point up the basic advantages of Barber-Greene *standardized* components. These

advantages include: quick delivery from stocks of standardized components...elimination of engineering time required when building "custom-made" conveyors...and fast, easy erection.

Trouble-free operation is an additional benefit of the factory aligned and adjusted drives and terminals. Flexibility in shortening or lengthening your conveyor is another plus.

Write for information on Barber-Greene Standardized conveyor components

56-12-PF




Barber-Greene

AURORA, ILLINOIS, U.S.A.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

USS HIGH STRENGTH STEELS...



Filling in ditches, digging new watercourses and cutting city streets—just another day's work for this Cat Crawler Tractor. This particular piece of equipment, owned by the City of Golden, Colorado, consists of a Caterpillar D4 Tractor equipped with 45 Bulldozer.

help relocate COLORADO WATERWAY!

The City of Golden, Colorado, is expanding. Hitherto undeveloped land is now being surveyed for city blocks and house lots. But before this could be done, much preliminary work had to be completed—like the job illustrated here, where a watercourse had to make way for a city street.

This big CAT track-type Tractor and Bulldozer, shown cutting a new stream bed, is typical of the high-powered, hard-working earthmovers used on this project. To handle these large tonnages of earth and fill without undue delay, the equipment had to be strong and sturdy; and at the same time, be able to resist the shock and withstand the abusive effects of rough, rocky terrain. To give their equipment the ability to stand up in service like this, Caterpillar Tractor Co., Peoria, Illinois, utilized the superior strength and long life of

USS MAN-TEN HIGH STRENGTH STEEL. This steel adds extra life to vital parts like moldboard, moldboard end plates, channels and stiffening members.

United States Steel produces three different grades of USS High Strength Steel—COR-TEN, MAN-TEN and Tui-TEN—each having distinctive characteristics and each recommended for certain end uses where its specific properties will assure longer service and greater over-all economy. All three grades have a yield point 50% higher than carbon steel and all offer properties which allow greater strength and toughness to be built into the vital parts of equipment that might be prone to failure.

In the construction field these steels can be used to replace carbon steel in the important parts of

shovels, dozers, scrapers, trucks and other such equipment to increase service life without increasing dead-weight. And if the use of thinner sections is possible, they can (1) reduce equipment weight without reducing its strength, or (2) increase the size and capacity without increasing the total weight or the power needed to move it.

NOW AVAILABLE

Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead giving your title or department to United States Steel Corporation, Room 5525, 525 William Penn Plaza, Pittsburgh 30, Pa.

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USS HIGH STRENGTH STEELS



UNITED STATES STEEL

GET ANOTHER FULL ROUND OF SERVICE FROM YOUR WORN OFF-THE-HIGHWAY TIRES



Selection of tread designs available for tires from 7.50 x 15 to 30 x 33 to fit variety of conditions and equipment.

TREADING truck and earthmover tires with the special Hawkinson Construction Tread is proving to be a considerable economy measure on many construction projects.

For approximately half the cost of a new tire, contractors repeatedly have obtained another full round of service out of a tire, and frequently a second and third if the casing hasn't been damaged beyond repair.

Before you buy new tires for any of your rubber mounted equipment, it will pay you to discuss your tire needs with one of the highly trained and thoroughly experienced Hawkinson Tread Operators located across the nation.

WRITE us for complete information on our widely accepted line of Hawkinson processed treads and the name and address of the nearest fully equipped Hawkinson operator.

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MINNEAPOLIS 13 MINNESOTA

**Less down time... longer life when
protective maintenance is done ON TIME!**



HOBBS Engine Hour METERS

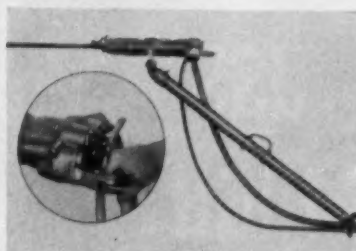
Modern engineers consider maintenance of powered equipment in terms of HOURS instead of miles. ON-TIME lubrication, filter replacement, oil change, overhaul, etc., means better performance and longer equipment life.

The Hobbs Meter, a true electric timing instrument, records actual running time in HOURS and MINUTES—not a revolution counter! Two models—direct-reading (upper illustration) and pointer type. Approved and recommended by leading manufacturers of construction equipment. Ruggedly built... easy to install in the field. See your factory branch, representative or distributor... or WRITE:

John W. Hobbs Corporation
2070 YALE BLVD. SPRINGFIELD, ILLINOIS
A Division of Stewart-Warner Corporation

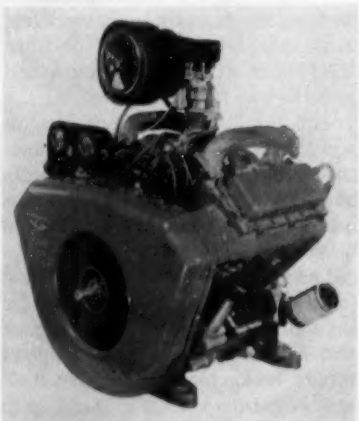


EQUIPMENT NEWS... continued



traction and restores full feed pressure. The operator works the drill, called the Lion, by operating a pair of levers on the back-head to provide adjustable feed pressure and blowing pressure.—Atlas Copco Pacific Inc., 930 Brittan Ave., San Carlos, Cal, or Atlas Copco Eastern, Inc., Paterson, N.J.

ENGINE OPTION—Clark Equipment Co. now offers General Motors diesel engines as optional power plants on two models in its Michigan tractor-shovel line. The Michigan 175A is available with a Detroit Diesel model 4-71 engine rated at 147 brake hp at 2200 rpm. Weight of the 175A with the new engine is 24,550 lb. Detroit Diesel's model 3-71 engine is now offered in the Michigan 125A tractor-shovel. The three-cylinder, 212.8 cu in. engine is rated at 105 bhp at 2200 rpm. The 125A weighs 19,340 with the new diesel.—Construction Machinery Div., Clark Equipment Co., Pipestone Rd., Benton Harbor, Mich.



AIR-COOLED ENGINE—Lycoming's new four-cylinder, V-type valve-in-head engine delivers 70 hp at 3000 rpm. The air-cooled engine has 4 in. bore, 3½-in. stroke, 176-cu in. displacement and a 6-to-1 compression ratio. It weighs only 463 lb, less the electric starter, generator, and flywheel housing,

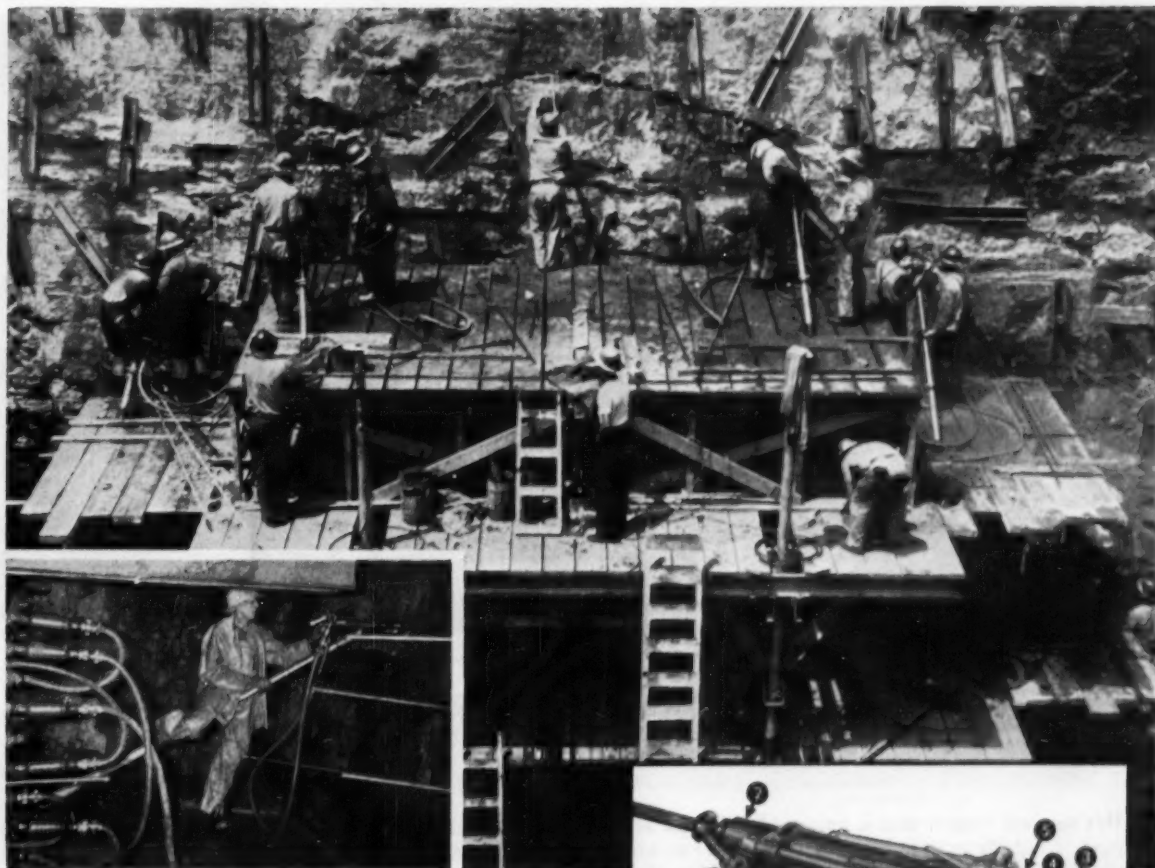


Photo shows line-hole drilling for start of tunnel portals. Inset photo shows close up of Jackdrill in action.

I-R JACKDRILLS DROVE NEW LINCOLN TUNNEL APPROACH

USING a top heading method and Ingersoll-Rand Jackdrills, the western approach to the new Lincoln Tunnel tube was driven through 700 ft. of rock with no delays and with the drilling synchronized to the mucking cycle.

Up to eight lightweight Jackdrills with air-leg feeds were used at the same time on the jumbo. Manifolded air and water simplified shifting of the drills. The 115 holes for each shot were drilled 15 ft. deep, using 1 1/2" Carset Jackbits and only one steel change.

This is another example of the versatility and ease of operation that have made I-R Jackdrills first choice with owners and operators alike, on mining and tunneling jobs all over the country. With the improved features of the new model JR38-B; the I-R Jackdrill will set still higher standards of performance and economy. Ask your I-R representative for complete details.



**NEW JR38-B
JACKDRILL**
has **7** improved
features

1. Maintenance-free steel centralizer
2. Easily renewable one-piece chuck
3. Reversible roll-type feed control handle
4. Simplified water-tube replacement
5. Interchangeable Jackdrill and Stopehamer backheads
6. Easier dismantling of feed leg
7. New, Lighter-weight telescopic leg



5-426

Ingersoll-Rand

11 Broadway, New York 4, N.Y.

DRIFTERS • JACKDRILLS • JACKHAMERS • WAGON DRILLS • CARSET BITS • AIR TOOLS • COMPRESSORS

Haul, Dump and Spread

Any Material
You Can
Top Load

USE

**C & D
Movall**

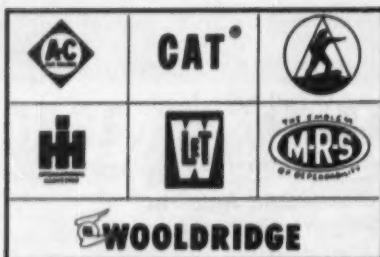


Movall's scraper-in-reverse design pushes load straight back. There's no danger of tipping. It's the only wagon that does work of both an end-dump and a bottom-dump.

This rugged wagon uses a unique dozer-type ejector that positively pushes out all materials, from sticky clay to shot rock, cleanly and quickly (25-yd. loads in 12-14 seconds). Movall dumps behind wheels so you can spread load like a scraper, with depth controlled (3 to 18") by tractor speed...or dump on grade, over edge of fill, and into hoppers at controlled rate; also unload while turning at end of road fill.

Built to take shock loads of 6-yd. buckets. Massive box-beam construction of high alloy steels prevents body spread, or damage to top rails.

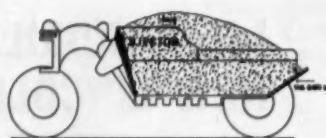
Available for all makes of rubber-tired tractors. Movalls are made in sizes from 12 to 26½ cu. yds., struck; 22 to 45 tons rated load, for:



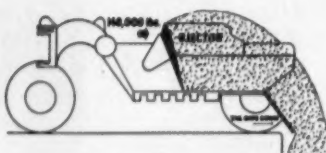
Allis-Chalmers T5300 and T5360
Caterpillar DW20, DW21, DW15, DW10
Euclid TDT, FDT, LDT
International 75 and 55
LeTourneau Super C
M-R-S — all models
Wooldridge — all models

Why tie up money in single-purpose units when you can get Movalls to use with any available rubber-tired tractor that hauls your scrapers? Buy Movalls where you buy your tractor...ask the dealer for a demonstration on our buy-and-try plan, or write C & D Division, Yuba Manufacturing Co., 701 East H Street, Benicia, California. Phone 628.

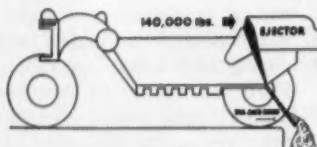
How It Works



LOADED



DUMPING



EMPTY

which are offered as optional equipment. A full pressure lubricating system is standard, and all engine accessories are flange-mounted and gear driven from the timing gear train housing. The engine is offered with SAE 3, 4, and 5-bell housings with special pump adaptors and shaft extensions available to suit requirements. The compact engine, the second in Lycoming's Full-Power line of industrial engines, is only 28 in. long, 27 1/2-in. wide, and 28 1/2-in. high minus the air cleaner. — **Lycoming Div., Avco Mfg. Corp., Stratford, Conn.**



POST HOLE DIGGER — Special feature of the new Roper post hole digger is a series of interchangeable digger heads designed for jobs ranging from digging in soft earth to digging through permafrost shale and even coral rock. Other features of the digger include the use of rust-proof zinc plated bolts, double tandem grease seals, and a new turnbuckle for four-way rigid adjustment. The digger can be attached to any two or three-point hitch on a tractor, jeep, or truck. A slip-clutch to eliminate shear-pin breakage and an easily attached 6-in. auger extension are also available. The unit is guaranteed for one year and the power gears are guaranteed for ten years. — **Roper Manufacturing Co., Zanesville, Ohio.**

INEXPENSIVE SAW — The Nifty chain saw, which sells for less than \$150, is a compact, lightweight unit with an efficient three-hp air cooled engine built especially for chain saw operation. It is equipped



WRIST-LIKE ACTION...

Produces Beautiful
Floor Finishes

The **NEW** *Kelley*

HYDRA-TROWEL

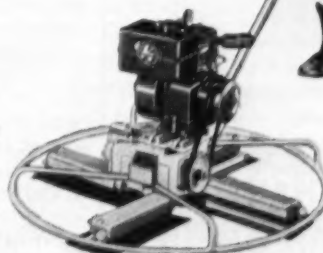
(PATENTS PENDING)

The new Kelley HYDRA-TROWEL duplicates the quality of hand-finishing yet does the work faster than hand-troweling and without the back-breaking drudgery. Low center of gravity and perfect balance make operation amazingly easy. There is none of the objectionable gyrating produced by power trowels with high centers of gravity. Four dual-purpose blades are used for both floating and finishing. Blade pitch is adjusted by finger-tip control on handle. Other HYDRA-TROWEL features include stationary guard ring for carrying machine, trouble-free gasoline engine with heavy-duty centrifugal clutch, and a long handle with grips widely spaced. Ask for demonstration and be convinced. Additional details and name of nearest distributor on request.

A few good distributor territories still available.



Kelley also makes the
Kelley Compactor for:
• Floating dry-mix topping
• Driving in surface
hardeners
• Grinding out surface
imperfections.



Kelley

MACHINE DIVISION

WIESNER-RAPP CO., INC.

285 HINMAN AVE., BUFFALO 23, N. Y.

MONOLITHIC CONSTRUCTION

HYDRAULICALLY RAISED SLIPFORMS



49 BRIDGE PIERS UNDER CONSTRUCTION

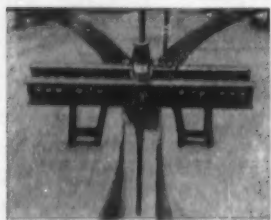
CARQUINEZ
STRAITS BRIDGE,
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Contractors:
Peter Kiewit

Silas Mason,
Mason &
Hanger,
F. S. Rolandi,
a joint venture



8 STORIES — 5 DAYS
including interior walls
Memphis, Tenn., 1955



Note compact jacking unit
Dependable, economical, used by
hundreds of contractors. We in-
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"Concretor" Hydraulic Jacks and Slipform Equipment

By **B. M. HEDE, INC.**
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EQUIPMENT NEWS . . . continued



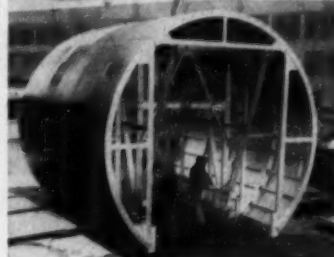
with an automatic cut-off switch that shorts out the magneto when the throttle is released. Other features of the saw include a pistol grip hand throttle, chrome track guide bar, fully automatic oiling, a rewind starter with nylon cord, and a float type carburetor. Available with 14, 16 or 19-in. guide bar, the saw is designed to cut within a few inches of the ground. — **Lancaster Pump and Mfg. Co., Lancaster, Pa.**



WINTER PROTECTION — Five styles of liners to wear with safety hard hats and caps are available from Bullard. Made of heavy duty, water repellent drill line with fire resistant flannel, the fabric liners are sanforized and can be laundered without damage. The liners are available with or without earlaps. The elastic wool knit liners are made in three styles, the snug fitting skull cap, the skater's type that covers the ears, and the arctic type that covers the entire head except for an eyeslit. — **E. D. Bullard Co., 275 8th St., San Francisco 3, Cal.**

LOW ENGINE SPEEDS—The big capacity design of CMC's model 90-M six-in. pump enables the engine to work at low speeds, thereby saving wear and tear and increasing pump life. The pump is powered by a radiator cooled, 224-cu in. Continental engine that de-

(Continued on page 183)



MAYO STEEL FORMS SPEED TUNNEL JOBS IN THE PHILIPPINES*

*5.2 Diameter Tunnel—Invert Last Ambuklag Project

Mayo produces all types of Tunnel Forms—telescopic, non-telescopic, separate sidewall and arch single unit, full round forms for monolithic pours, etc. Each is designed for the exact requirements of the job in any part of the world—be it tunnel sewer or conduit.

Write for FREE Bulletin No. 22 or send details.

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TUNNEL AND MINE
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Lancaster, Penna.

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For details, estimates and catalog, write nearest office.

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Offices in St. Louis, Mo.; Kansas City, Mo.; Lincoln, Nebr.; Minneapolis, Minn.; Ft. Wayne, Ind.; Milwaukee, Wis.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Metuchen, N. J.; Rochester, N. Y.; Springfield, Mass.; Washington, D. C.; Decatur, Ga.; Charlotte, N. C.; Dallas, Texas; Tulsa, Okla.; Houston, Texas; Los Angeles, Cal.; Oakland, Cal.; Denver, Colo.

There's EXTRA Performance in EVERY ATTACHMENT

with AUSTIN-WESTERN All-Wheel Drive and All-Wheel Steer



V-Plow With All-Wheel Drive, there is plenty of power and traction for opening rounds—and especially important when thick crusts have formed on old snow.



Snow Wing Rear Steer makes it easy to maneuver around highway signs, or other obstructions; is also used to resist the side thrust of a heavy load on the wing.



Bulldozer All-Wheel Steer provides exceptional maneuverability under all conditions, and is also used to angle the blade on work like this, to shed the material sideways.



Roller Another attachment which often takes the place of a costly, single-purpose roller. It has many uses . . . on many materials, including gravel, blacktop and soil cement.



Plainsman Used for building new roads, widening old roads or raising grade elevations, this elevating grader can be attached or detached in a matter of minutes.



Scarifier Most popular of all attachments. All teeth are used for light work; while every other tooth can be removed for deep scarifying of hard material.

All-Wheel Drive for maximum mobility and 30 percent more Power-at-the-Blade—power that is made still more effective by Torque Converter drive. All-Wheel Steer for extreme maneuverability. Put them together and you

have teamwork that keeps Austin-Western Power Graders working where other graders fail. Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes



AUSTIN-WESTERN WORKS

BALDWIN-LIMA-HAMILTON
Construction Equipment Division

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Shovel-loading big-chunk rock into Dumptor — square body opening provides 64 square feet of target for easy loading over the side, or either end. It's the heavy-duty hauling unit with a ton of strength for every ton of payload capacity!



Plenty of power on the haul — (check high ratio of H.P.-to-loaded-weight in Dumptor story on next page). Dumptor also travels at same speeds in either direction for fast, no-turn shuttle hauling.



One-second gravity-dump speeds haul cycles. Dumptor has no troublesome body hoist, no hoist maintenance. Gravity-dump never balks, and never wears out.

IN ROCK LIKE THIS

you need Dumptors

When you are loading $1\frac{1}{2}$ to $2\frac{1}{2}$ yards of rock at a single pass, hauling units need plenty of strength to last. With Koehring heavy-duty Dumptor, there's a ton of strength for every ton of payload capacity. *It's built for rock.* Sides and ends of all-welded 6-yard body are heavily rib-reinforced. Double-plate bottom, lined with multiple steel beams, cushions the shocks of rock loading. Bolted or free-swinging kick-out pan adds another $\frac{1}{2}$ " steel plate to Dumptor bottom for extra strength.

There's plenty of strength, too, in the heavily-trussed chassis to take constant pounding of heavy loading and rough, off-road hauling. What's more, Dumptor has no leaf springs — just one big snubber-type chassis spring on the steering axle — none on the drive axle. Big drive tires eliminate the need for more springs, absorb loading and hauling shocks — save spring maintenance.

Even with all this heavy-duty strength, Koehring Dumptor® still has more than 6 H.P. for every ton of loaded weight. It accelerates fast, pulls through soft ground with less shifting, climbs 24% grades fully loaded. If you have a tough hauling problem, see your Koehring distributor about this heavy-duty 6-yard Dumptor. Why not call him now?

KOEHRING COMPANY

MILWAUKEE
16
WISCONSIN
CK642



Subsidiaries:
JOHNSON
PARSONS
KWIK-MIX

Digs within 12 inches of side obstructions

Off-set digging boom on Parsons 250 Trenchliner® puts trench within 12 inches of curbs, poles, buildings — digs almost directly behind either crawler. Reversible conveyor shifts through machine by power in less than 1 minute, discharges right or left. 250 production capacity: $3\frac{1}{2}$ inches to $9\frac{3}{4}$ feet per minute. Widths: 16 to 42 inches. Depths to $12\frac{1}{2}$ feet. Four other Parsons Trenchliners are also available in all sizes and types.

PARSONS • Newton, Iowa
(Koehring Subsidiary)



Portable, easy-charging $3\frac{1}{2}$ -S Dandie® mixer

With this Kwik-Mix $\frac{1}{2}$ -bag concrete mixer, charging height is low, only 43 inches. Convenient end-discharge, easy tilting drum, and unobstructed spotting area speed loading into wheelbarrows. Push down tow-pole gives safe, 1-man handling on the job, is easily hitched for trailing. Other models: side-discharge tilter, end-discharge non-tilt. Other concrete mixer sizes up to 16-S. Also: plaster-mortar, bituminous mixers and Moto-Bugs®.

KWIK-MIX • Port Washington, Wis.
(Koehring Subsidiary)



254 to 1321-barrel bulk cement plants

Easy to ship, simple to erect and re-assemble at next site, Johnson silos are all-welded in one piece, 11 or 12 ft. diameter. Single silo capacities: 254 to 611 bbls. Has screw conveyor, bucket elevator, receiving hopper, one or two 1,000-lb. batchers. Larger batcher, extra leg and elevator height available for charging mix trucks. Second silo at ground level increases total plant storage capacity up to 1321 bbls. of cement.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

VED



Westinghouse Electric Corporation

**Hydraulic torque converters and
power shift transmissions
meet specialized equipment needs**

Harmonizing engine characteristics with your drive problems is a specialty of Westinghouse hydraulic drives engineering. The result is a hydraulic drive that assures maximum *work output* of your equipment, simplifies operator training, and reduces maintenance.

Westinghouse hydraulic drives are currently being used on heavy-duty construction equipment, off-highway trucks, special-purpose military vehicles and oil well servicing rigs.

The Westinghouse torque converter is based on the Schneider single-stage system which provides highest efficiency over an extended operating range.

Because Westinghouse manufactures drive components, and not end products, you are assured complete confidence on your advanced design planning. For more information write Westinghouse Electric Corporation, Gearing Division, Pittsburgh 1, Pennsylvania.

J-07353

**Developed to meet your special needs in earth moving,
construction and materials-handling equipment.**

(1) Westinghouse single-stage torque converter showing simplicity of basic parts. (2) Matching equipment requirements, Westinghouse engineers analyze advance design planning; result (3), a typical Westinghouse torque converter — power shift transmission package.

1

2

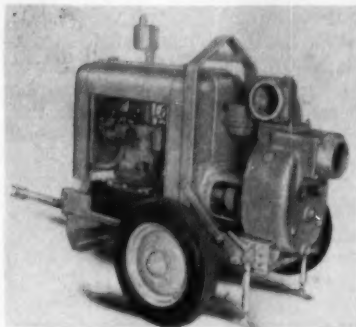
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REACTION MEMBER
PUMP
TURBINE



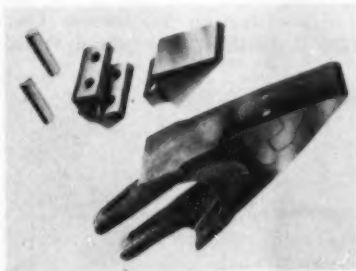
WATCH WESTINGHOUSE!

COVER THE PRESIDENTIAL CAMPAIGN ON CBS TELEVISION AND RADIO!



velops a constant 55 hp at 1800 rpm. Safety controls automatically shut off the unit in case of high engine temperature or low oil pressure. The pump features dual volute priming action to assure fully automatic priming. A top entrance suction connection is provided for dependability and the water ways of the pump will easily pass a 2-in. solid sphere. It is available with skids, steel wheels, or pneumatic-tired wheels.—**Construction Machinery Co., Waterloo, Iowa.**

CHOICE OF DIESELS — Huber-Warco Co. now offers a choice of General Motors or Cummins diesels for its 6-D and 7-D series motor graders with torque converters and full power shift transmissions. The new models are the 6-D2, powered by a 125-hp JN-6-B1 Cummins diesel, and the 7-D2, powered by a 150-hp JBIS-600 Cummins diesel engine. Standard on both grader models is a powered sliding mold-board, and complete hydraulic control for every working position.—**Huber Warco Co., Marion, Ohio.**



REPLACEABLE DIGGER TEETH — New design principles have been incorporated in the Bulldog line of replaceable digger teeth for shovel dippers, backhoe, dragline, and clamshell buckets. The Bulldog tooth has only three parts, a universal weld-on adaptor that attaches to the old tooth, an easily changed replaceable tip, and pos-



Ray Popp (left), of Pittsburgh, and a co-worker put muscle behind their *Snap-on* Heavy-Duty Loxocket wrenches. They're working on the false work used to support a span of the Mackinac Bridge.



U. S. Steel photo

Mackinac Bridge REACHES SKYWARD

with a boost from *Snap-on Tools*

Stretching five miles between the upper and lower peninsulas of Michigan, the new Mackinac Bridge will provide a much-needed link between the two sections of the state. The bridge will replace ferry service — cutting transit time from 53 minutes to 10 minutes.

No one has figured how many bolts will be required to finish the project. One thing for sure, though — *Snap-on* tools, like the Loxocket wrenches ironworker Ray Popp is using, are on the job. Popp has used *Snap-on* tools for years on many different jobs and says, "I couldn't get along without them."

Men who work on big jobs — erecting or repairing — depend on husky, powerful *Snap-on* tools. Built with an extra safety factor to protect workers, *Snap-on* tools give tremendous leverage to break loose rusted nuts and bolts or pull them up to the tightest degree.

See your *Snap-on* tool dealer or write for a copy of catalog "V" listing over 4,000 *Snap-on* tools for building the big jobs or servicing tractors, trucks and cars.

SNAP-ON TOOLS CORPORATION

8042-J 28th Avenue • Kenosha, Wisconsin

*Snap-on is the trademark of Snap-on Tools Corporation.





with brand new working conveniences and ALL the features you want... "built-on" years of masonry and field experience by the originators of the West System — the nationally used system for moving palletized masonry (and related) materials, with overall savings of 15% and more.

- Lifts over 20 ft. in 17 seconds—3000 lb. capacity
- Heavy duty welded boom and frame of double-strength pipe and plate construction; chrome plated hydraulic shafts
- Automatic self-leveling—adjustable, non-tilt forks
- Powered by new Minneapolis-Moline "445" Tractor
- Power steering . . . Ampli-Torc Transmission
- Improved flotation without ballast or Hydrefill. (Wheels, Axles and Oversize Tires engineered to the load each will carry)
- Double-Disc Brakes . . . Rear Wheel Drive
- Increased to 53 Horsepower
- Dependable — Versatile — Safe

The West SKYTRAK "445" when used in conjunction with the other components of the WEST SYSTEM . . . STANDARD AND HALF BRICK BUGGY, STANDARD AND HALF HI-LIFTS and MORTAR BUGGY, is the ONLY complete handling system to move materials from supplier to mason's work station.

Without cost or obligation, please send me full particulars on:

☐ The New SKYTRAK "445"

☐ The West System—"Keep Masonry Materials on the Move"

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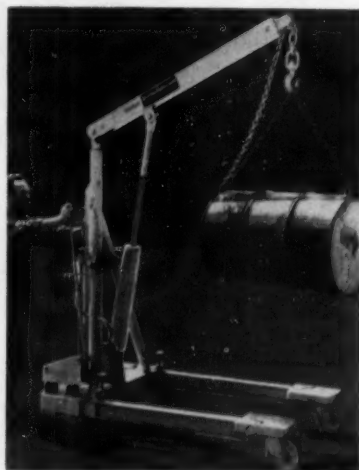
WEST

BRICK BUGGY CORPORATION

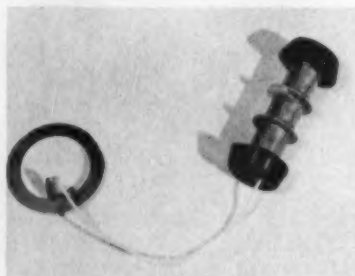
4310 Mayfield Road Cleveland 21, Ohio

EQUIPMENT NEWS . . . continued

itive lock pins for securing the tips to the adaptor. To attach the tooth the old tooth is burned off to fit the adaptor, which is welded in place. The replaceable tip is secured to the adaptor simply by tapping the pins in place with a hammer. The adaptors are made in 15 widths ranging from 2 1/4 to 7 in., to fit all popular makes of excavating equipment.—Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio.



VERSATILE SHOP AID —The Stratton Hydro-Crane lets one man remove engines, lift truck front ends, and transport barrels and other loads. Available in 1, 2, and 3-ton models, the portable hydraulic floor crane is equipped with a safety release valve that automatically prevents overloading. It also has a safety plunger foot brake, adjustable legs, and a sliding extension beam that lets the operator adjust the unit to suit his load. — Stratton Equipment Co., 2030 E. 105th St., Cleveland, Ohio.



COOLING SYSTEM CLEANER — A simple device called the Radion Magic Filter derusts an automotive water cooling system and keeps it that way. Actually a self-generating battery, the unit sends a small

New England's Largest Wrecking Firm,

John J. Duane Company, at work.



WHOLE FLOOR OF BUILDING has been pulled loose by this crane of John J. Duane Company. To do it, workmen drove two holes in the floor (walls and roof had already been removed) and inserted cable down through holes

and up to crane. Crane then tugged until floor ripped loose. This is typical of workout the firm's cranes receive, but using Cities Service lubricants they give flawless performance.

Razes buildings, raises efficiency using Cities Service lubricants

**9000 hours on a crane and no trouble . . .
truck goes 65,000 miles, uses no make-up oil!**

JOHN J. DUANE COMPANY, Quincy, Massachusetts, operates 10 cranes, 14 gasoline and diesel trucks, three forklifts, and a bulldozer . . . all powered and lubricated by Cities Service. The results are notable. Says John Duane: "Using Cities Service C-300 Motor Oil, one of our diesel cranes has gone 9000 hours with absolutely no trouble, and the oil has doubled the period between overhaul for our truck fleet. Furthermore, one gasoline truck has gone 65,000 miles without adding a drop of C-300 between crankcase drains. We're also

mighty pleased with Trojan P-2 Grease. Used on the tracks of our cranes, Trojan P-2 keeps them operating flawlessly under the most severe conditions."

Like Mr. Duane, you'll lengthen overhaul periods, cut operating costs when you start using Cities Service products. Get all the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES  SERVICE
QUALITY PETROLEUM PRODUCTS

OWEN BUCKETS

*Reduced Costs
in Countless
Hopper
Operations*



Photo Courtesy of Thew Shovel Co.

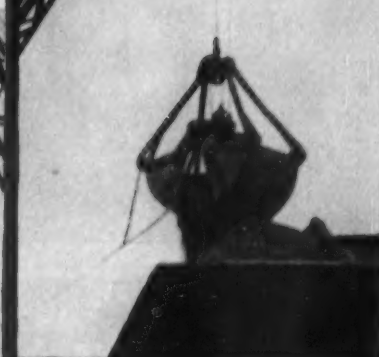


Photo Courtesy of Link Belt Co.



*"A mouthful
at every bite"*

Write for the Owen Catalog...

THE OWEN BUCKET CO.

2020 Broadway, New York 11, N.Y.

Branches: New York, Philadelphia, Chicago, Boston, Portland, Portland, Ore., San Francisco, Calif.

EQUIPMENT NEWS . . . continued

charge through the water in the cooling system to ionize the water, the engine block, and the radiator components. This results in an action that decomposes the rust scales and encrustations in the block so that they can be flushed easily from the system. Used extensively by the Army and Navy, the device has a patented element made of fused natural metals held in constant bond through an insulated grounding principal. The manufacturers say the unit needs about the same care as a spark plug. It should be cleaned every 500 mi, and the radiator should be clean when the unit is installed.—**Product Promotion Corp.**, 148 S. Robertson Blvd., Beverly Hills, Cal.



HEATS AUTOMATICALLY —

The new Insto-Gas salamander has a thermostat that automatically turns on the main flame when heat is needed. When the desired heat is reached, the main gas control valve closes automatically and the salamander returns to pilot flame operation. The thermostat is activated to turn on the heat when the temperature drops $\frac{1}{2}$ deg below the setting. A control dial, attached to a 54-in. lead so that the control can be located at a distance from the salamander, provides six heat ranges. The unit is available for use with either natural gas or L. P. gas. — **Insto-Gas Corp.**, 998 E. Woodbridge, Detroit 7, Mich.

POSITIVE SEAL — The WV lock valve is designed to stop a loaded hydraulic cylinder from creeping because of seepage. The new lock valve, which can be applied to virtually any hydraulic lift system, supplements the seal on a standard directional valve to positively lock the cylinder until the flow is reversed. The valve can handle up to 20 gpm and will operate satisfactorily at up to 1500 psi. The
(Continued on page 191)



Semi-Automatic Rebuilding of SHEEPSFOOT TAMPERS

A novel idea for salvaging sheepsfoot tampers, with a saving of 45% in cost and 50% in down time, originated with Dave Moodie, master mechanic of J. A. Thompson and Son, large West Coast contracting firm.

As routine maintenance procedure the 220 individual tamper boots on each of the 24 compactors operated by this firm were manually hard-faced until recently in a circle-and-cross pattern; the tamps lasted three or four months before a loss of gauge made them no longer usable. In an eight hour shift the maintenance weldor could manually rebuild and hard-face 18 worn tamps.

Since the firm installed a semi-automatic welder adapted to the use of Stoodly $\frac{3}{16}$ " wires, the picture has altered completely. Today the weldor, using Stoodly 121, rebuilds 70 worn tamps in a single shift! Mr. Moodie's procedure employs "weld-casting" of the wearing face, using a split carbon mold of the correct finish dimensions. Stoodly 121 is applied by the semi-automatic welder, with the mold shaping the large puddle to produce a hard-faced wearing surface of the required depth and gauge.

The rebuilt tamps hold their size twice as long at a considerably lower cost than hard-faced standard replacement boots. Material and labor are approximately \$1.25 each for the rebuilt tamper.

You will find many suggestions for prolonging the life of all types of heavy equipment in the Stoodly Guidebook. Your Stoodly dealer has a copy for you. Look him up in the "Yellow Pages" of your phone book or write direct.



More speed, easier build-up and automatic sizing are obtained by this carbon mold clamped around the sheepsfoot tamper. Stoodly 121 wire is applied semi-automatically.



Mold is machined to correct size, grips stem tightly to hold weld metal on wearing surface.



Notice how gauge is still held after 4 months service. Impact strength of Stoodly 121 withstands repeated blows of twelve pound sledge used to seat and align tamps during installation.

STOODLY COMPANY

11972 East Slauson Avenue
Whittier, California

New 190 HP



POWER-Flow Adams 660

**Forward speed to 27.4 mph
— reverse to 24.4**

New POWER-Flow Adams 660 always works at fastest possible speed and highest efficiency. The Adams torque converter automatically balances the speed and applied power to match the load. Engine torque is multiplied 3-to-1 in infinite gear ratios through a 4-speed,

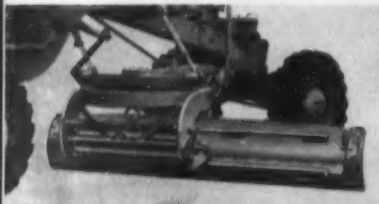
heavy-duty, constant-mesh transmission. Tail-shaft governor automatically adjusts engine speed to match variable load conditions.

This means maximum flexibility in power transfer—provides a cushion against load shock—reduces wear and maintenance on engine and transmission. When bucking heavy loads, the necessity for frequent gear-shifting is

eliminated. Operator gets *more* work done—with *less* effort.

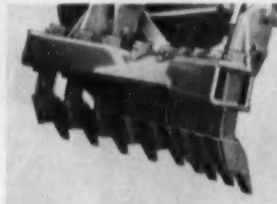
With Adams POWER-Flow converter, the engine always operates at uniform speed, with smooth application of power, with minimum repair and lubrication cost. Delays due to stalling are eliminated. Operator has full power, tailored to the load, available constantly to meet all working conditions.

Optional Equipment Widens Work Range



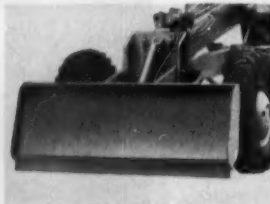
Power-Shift Moldboard

For fast shifts to either side while grader is in motion without changing blade setting. Powerful hydraulic pump gives instant movement of blade through control at operator's finger tips.



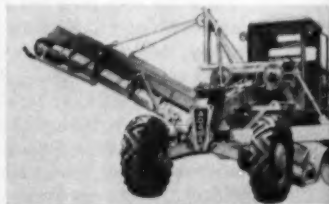
Scarifier

Sturdy, rigid V-type scarifier breaks materials too hard to cut. Teeth easily replaced by lifting locking key. Operator can rotate blade a full 360° without removing scarifier block.



Bulldozer

Hydraulically controlled, 8 feet wide, 35 inches high. Handy for leveling fills around culverts, pushing debris from grade. Note: special push-block attachment available for push-loading scrapers.



Elegrader

Cost 700 to 1500 cu. yds. per hr., or load 400 to 800 cu. yds. (more than truck-a-minute). Hinged conveyor folds for travel. Elegrader easily attached to "660" grader for high-production loading.

Leveling heavy fill, cutting high banks, digging deep ditches; that is where **POWER-Flow** Adams 660 moves bigger loads at fastest possible speed, with greater profits to you.

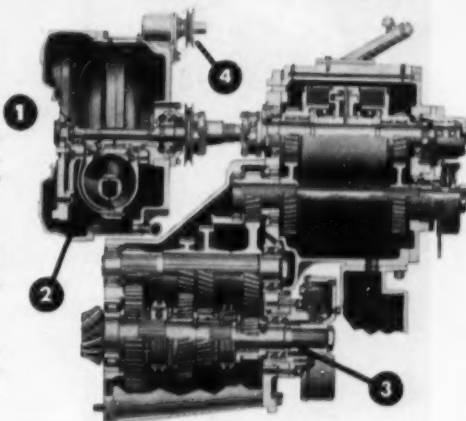


1. 190 hp Cummins or General Motors Diesel Engine (not shown).

2. Torque Converter — Adams single-stage type. Multiplies torque 3-to-1 — provides infinite gear ratios — absorbs shock loads to prevent engine lugging or stalling.

3. Constant-Mesh Transmission — with power clutch for forward-to-reverse motion without shifting — 4 speeds forward to 27.4 mph, 4 reverse to 24.4 mph.

4. Tail-Shaft Governor — adjusts engine speed automatically to maintain the grader speed pre-selected by operator.



with torque converter

Shift forward to reverse with simple foot control

The easy operation of **POWER-Flow** Adams 660 appeals to operators, gets more work done for owners. Adams power-shift clutch shifts instantly in any gear range — from forward to reverse, reverse to forward — with the simple movement of a foot pedal. This leaves operator's hands free for steering, enables him to handle other controls with greater accuracy. You will find this feature a distinct advantage in shuttle work on heavy construction and when bucking drifted snow.

POWER-Flow "660" offers many extra advantages:

- **Power Steering** — gives the "feel" of hand steering, with hydraulic power doing the work.
- **Double-Action Hydraulic Braking System** — Service brake applies pres-

sure to brake on transmission as well as to 4 tandem drive-wheels, giving sure, quick stops with little pedal effort for the operator.

- **Engine Rubber-Mounted** — with no vibration transmitted to machine. Reduces operator fatigue.
- **Foot Accelerator** — makes driving through traffic as easy as driving a truck. Foot accelerator or hand throttle may be used when working.
- **Six Big Tires** — 14.00 x 24 — for adequate traction and flotation in any materials, under any working condition. (16.00 x 24 size tires optional.)
- **Slide-Shift Moldboard** — shifts easily for long reaches.
- **Optional Equipment** — includes Power-Shift Moldboard, Scarifier, Cab, Bulldozer, Elegrader, V-type Snow Plow and/or Wing, Snow-Blo Wing, and Rotary Snow Plow.

Look into **POWER-Flow** Adams 660

For cutting ditches, shaping shoulders, bank sloping, spreading fill, leveling sub-base, accurate final-grading, maintaining roads, or plowing snow... 190 hp **POWER-Flow** "660" will keep your work ahead of schedule. Write for details and work specifications.

NOTE: You have a choice of 5 other Adams graders, ranging in size from 60 to 150 hp; and belt-type **Traveloader** for loading materials from windrow or stockpile.

Adams, Power-Flow — Trademark AG-1262-G-6



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Under an Army Engineers contract, Southern Roadbuilders, Inc., Augusta, Ga., is general contractor for this section of work at MacDill Air Base.

15-in. Concrete at MacDill Air Base Laid with Bethlehem Dowel Units

Expansion of facilities at MacDill Air Force Base in Florida included the laying of a new runway extension 500 ft wide by 1420 ft long and a connecting taxiway 1420 ft by 75 ft. Shown above is the pouring for a parking apron 980 ft by 1250 ft.

Because these new facilities must serve the heaviest planes in use today and take the punishment of jet take-offs, concrete was laid generally 15 in. deep. And Bethlehem Dowel Units were used in all dowelled transverse joints.

Bethlehem Dowel Units were chosen for the heavy-duty concreting at MacDill Air Force Base for a number of reasons. Bethlehem Dowels extend across the paving joint and are so installed that they transfer the loads of heavy planes from one side of the joint to the other while offering no substantial restraint to the movement of the slab in its own plane. The unit holds the dowels in accurate alignment at all times, both horizontally and vertically, and permits their free movement in the concrete.



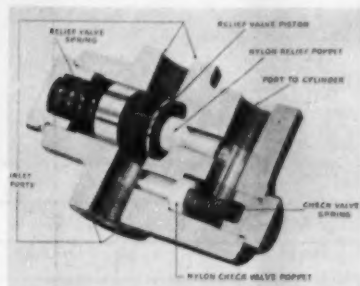
The Bethlehem Dowel Unit reaches the job site completely fabricated, ready for installation. Two men can easily handle the unit, with no delay to pouring time.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL





lock valve has two valves, check and relief, and two inlet ports. The one not used can be either plugged or used as a pressure gage port. The lock valve can be located in the line supplying either the head end or the rod end, or both. — Webster Electric Co., Racine, Wis.

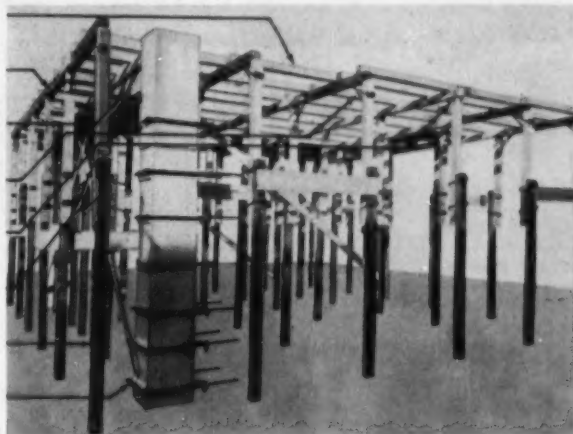


NEW CARRIER—The latest Lorain Moto-Crane, a 35-ton unit, is mounted on a newly designed, 28½ ft long, 122 in. wide truck carrier powered by a gasoline or diesel engine with either a 10 or 15-speed transmission. Top highway speed is 37 mph. The carrier is supplied with 6x6, 6x4, or 8x4 axle arrangements. With the 8x4 axles, the carrier is stable at high lifts without outriggers. Hydraulic power-assisted steering is standard and power brakes are available. Tires are 14.00x20. The crane is mounted on Lorain's patented "Shear-Ball" mounting, which needs little lubrication or adjustment because dirt and mud are sealed out. The three-position turntable mounting plate on the carrier bed allows it to be adjusted for the digging ranges of various front end equipment. The crane mounts the new Lorain square-tubular-chord boom made of lightweight alloy steel. A 14-ft gantry is standard equipment. It is easily convertible from crane to clam, dragline or hoe.—Thew Shovel Co., Lorain, Ohio.

(Continued on page 193)

The Perfect Set-up FOR FORMING A SUSPENDED REINFORCED CONCRETE FLOOR

JOIST
PURLIN
BEAM CLAMP
SHOREHEAD CLAMP
SLIP-IN SHORE HOLDER
SHORE CLAMP
SHORE
COLUMN CLAMP



Ellis Metal Parts
+
Ellis Sticks or a
Contractor's Own
Wood Members

Ellis Methods Provide the Greatest Speed and Economy!

This typical arrangement shows how simple it is to erect forming members using Ellis Methods. End assemblies, each consisting of a short purlin and two shores, are assembled on the ground, raised and braced. Longer purlins connect these, slip-in shores are added between, and joists laid across the top. Held together by Ellis Adjustable Clamps, wood members are interchangeable and have more than 10 times the life of forming lumber used under ordinary methods, making big savings of material. Ellis Beam and Column Clamps are used on all beam and column forms. The entire assembly is simply laid together—"up and down" fast—resulting in great labor economy.

Ellis

MFG. CO., INC.

211 N.W. 4th St., Oklahoma City, Okla.

MARVEL SYNCLINAL FILTERS

For Dependable Protection on Construction Industry's Hydraulic Equipment

CONSTRUCTION ENGINEERS and MAINTENANCE MEN, whose job it is to keep machinery operating at peak efficiency, are specifying Marvel Synclinal Filters on new equipment and standardizing with Marvels on all existing equipment.

Hydraulic Oils MUST BE CLEAN

to Protect Equipment and Reduce Maintenance.

IT'S THE ACTIVE FILTERING AREA THAT COUNTS!

The Synclinal design of Marvel Filters provides that all-important balance between maximum ACTIVE filtering area and sufficient storage capacity for filtered out particles. Thus, longer periods of operation are attained before filter cleaning becomes necessary. Marvel Synclinal Filters are easy to clean because both sump and line types may be disassembled, thoroughly cleaned and reassembled, on the spot, in a matter of minutes. Line type may be serviced without disturbing pipe connections.

OVER 700 ORIGINAL EQUIPMENT MANUFACTURERS NOW INSTALL MARVEL SYNCLINAL FILTERS AS STANDARD EQUIPMENT.



SUMP TYPE
(Cutaway)

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Choice of Marvel mesh sizes range from coarse 30 to fine 200.

IMMEDIATE DELIVERY

As in the past, Marvel continues to offer IMMEDIATE DELIVERY.

FILTERS FOR FIRE-RESISTANT HYDRAULIC FLUIDS

Marvel's most recent development is a filter for efficient filtration of all types of fire-resistant hydraulic fluids.

WATER FILTERS

Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced Synclinal design.



LINE TYPE
(Cutaway)

MARVEL ENGINEERING COMPANY

7227 N. Hamlin Ave., Chicago 45, Ill. PHONE: Juniper 8-6023

Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated —

☐ Catalog #107—For Hydraulic Oils, Coolants, Lubricants

☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)

☐ Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)

☐ Catalog #301—For Water

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Company _____

Address _____

City _____

State _____

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MANITOWOC 1-YD. 1600

MORE MACHINE FOR YOUR DOLLAR!

Outclasses comparable rigs in every ...important performance feature

	Manitowoc 1-yd. 1600	Competitive 1-yd. Machines					
		A	B	C	D	E	F
Shovel Boom	22'6"	21'	21'	20'	21'	21'6"	21'
Crane Boom	45'	40'	40'	35'	40'	40'	30'
Trench Hoe Boom	22'	24'	21'	20'	20'	24'	19'
Air Controls Available	YES	NO	NO	NO	NO	NO	NO
Weights (in lbs.) Shovel	79,500	63,325	54,670	53,500	57,750	61,000	62,850
Crane	70,300	54,870	53,000	53,400	53,950	53,000	54,300
Dragline	70,580	55,070	53,725	51,700	53,600	53,000	54,100
Trench Hoe	75,415	62,625	52,430	62,000	53,400	61,000	60,400
Rated Capacity at 12' Radius with 45' Boom (Pounds capacity)	40,000	39,000	35,700	36,200	36,500	40,000	34,600
Average Price Per Pound	44c	53c	55c	51c	56c	58c	54c

You get more for your money with a Manitowoc Model 1600. No other 1-yd. unit in the field offers as much in quality features, gross weight and actual price per pound. Here's a one yard machine with the speed and guts to outperform many 1¼ and 1½-yd. units.

Simply designed, with only 13 gears and pinions assures more useable power from every unit of horsepower; a real heavy weight, with weight where weight is needed; easier maintenance with less downtime; torque

converter available for smooth power, precise load handling; completely *self-removable* counterweight (12,000 lbs.) speeds transport between jobs; large, wide crawlers and roller path increase stability; rugged construction throughout keeps machine on the job.

Compare the outstanding advantages of the 1600 with ordinary 1-yd. rigs—contact your Manitowoc distributor for the complete story.

MANITOWOC ENGINEERING CORP., Manitowoc, Wis.



**Dragline, Clamshell,
20-ton Crane**



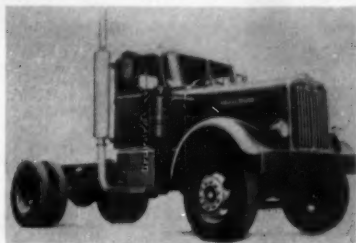
Shovel, Trench Hoe

MANITOWOC

SHOVELS
1-5½ YD.



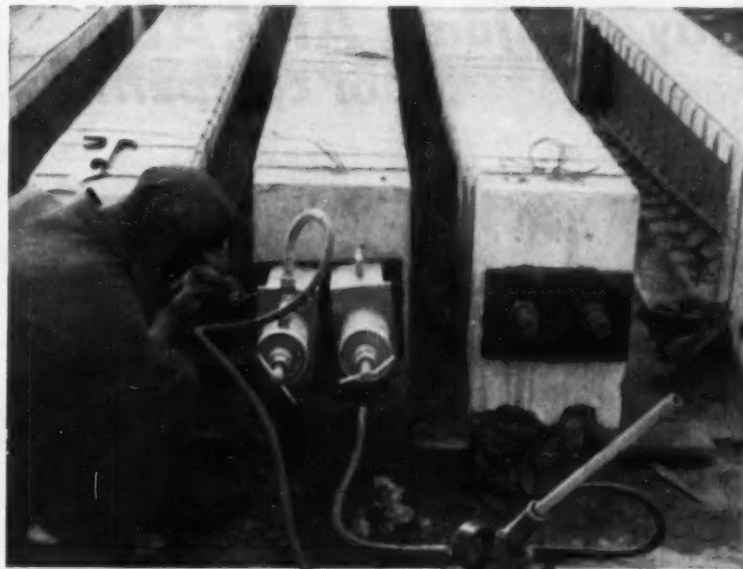
CRANES
20-100 TON



ALUMINUM CABS—Additional payload advantages resulting from extensive use of aluminum in the cab, chassis cross-members, transmission case and cover, and other components, are built into two new tandem-axle truck models developed by the Autocar div. of the White Motor Co. The lightweight models, the 33,000-lb. gvw model DC102TL and the 50,000-lb. gvw DC10264L, have all-aluminum cabs with an aluminum skin over a girder-type frame of aluminum alloy. Even the wheels are of forged aluminum. Both models are powered with Cummins 165-hp HRB diesel engines as standard equipment, and other lightweight Cummins engines up to 250 hp are optional. Both axle-forward and axle-back models are available.—White Motor Co., Cleveland 1, Ohio.

NEW FLUX—Lincoln Electric Co. has added a new flux, called H-560, to its line of hardsurfacing agglomerated alloy fluxes. Designed for maintenance work on wearing parts subjected to severe abrasion and medium impact, the flux is an agglomerated mixture of fluxing materials and alloys that produces a high carbon, high alloy weld deposit when used with Lincoln's L-60 mild steel automatic electrode wire. Alloys are added to the weld deposit through the flux. It will make a deposit with a hardness of 53 to 61 Rockwell RC and it cannot be torch-cut or forged. The deposits are said to resist scaling and flaking, and to perform successfully under abrasive conditions at temperatures as high as 1100 deg. F.—Lincoln Electric Co., Cleveland 17, Ohio.

LOUD SPEAKER—Motorola's new Power Voice speaker for two-way radio installations incorporates a compact, built-in transistor amplifier that gives up to 10 times the audio output of standard speakers. The new speaker also has a bandpass frequency response, tailored for mobile service, that accents voice frequencies but sup-



Post-tensioning girders with Simplex equipment. Note single pump operating dual "Re-Mo-Trol" units.

Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available

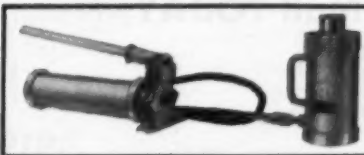
in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

SIMPLEX "JENNY" is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.



TEMPLETON, KENLY & CO.

2509 Gardner Road • Broadview, Illinois

Stay one jump **AHEAD** of competition



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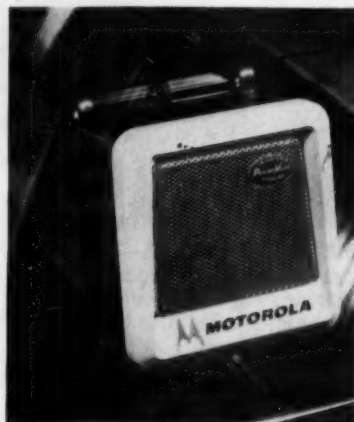
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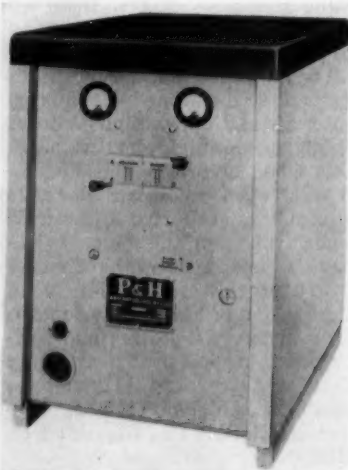
Please mail us sample copies of CD with complete information on how this construction market letter can help our business. No charge or obligation.

Firm.....
Name.....
Type of Business.....
Address.....

EQUIPMENT NEWS . . . continued



presses ignition noise and other interference. The speaker, which weighs only six lb, is enclosed in a compact steel case measuring only 5¼x5¼x3¼ in. The Power Voice speaker is available with Motorola's Twin-V and Private Line radio equipment, and as a replacement for standard passive speakers in conventional mobile two-way radio installations. Hardware for firewall or under-dash mounting is included, and an optional kit can be obtained for mounting the speaker on the steering column.—**Motorola Communications and Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.**



BETTER CONTROL—Harnischfeger's new line of modified constant voltage welders are said to permit better control over a wide range of applications. The line consists of 300, 500, 750, and 1200-amp machines. The main feature is an adjustable slope control that gives a softer arc to eliminate burn-back and stubbing. It also eliminates the

This Booklet shows...



1. System
Design
Savings



2. Installation
Savings

3. Operation
Savings

4. Maintenance
Savings

...how Transite Sewer Pipe
saves in **4** important ways

Selecting the right pipe material for a new sewage system—or for additions to an existing one—is a problem of major importance to *all* concerned in influencing a choice. *And* it can be solved to the *complete satisfaction* of both installer and user with economies in each of these stages—(1) system design (2) installation (3) operation and (4) maintenance.

Engineers thinking in long-range terms of thoroughly proved sewer main performance . . . contractors inter-

ested in serving community needs at new lows in installed cost—both should know all about Transite® Pipe and the Ring-Tite® Coupling. Here is a new booklet that tells and shows how Transite Pipe reduces infiltration, keeps out roots; maintains high flow capacity; speeds installation; permits designing the system for savings. Send the coupon for it today.



Johns-Manville
TRANSITE SEWER PIPE
WITH THE RING-TITE COUPLING

Johns-Manville, Box 60, New York 16, N. Y.

Gentlemen—Please send me your new Transite
Sewer Pipe Brochure, TR-165-A.

Name _____ Company _____

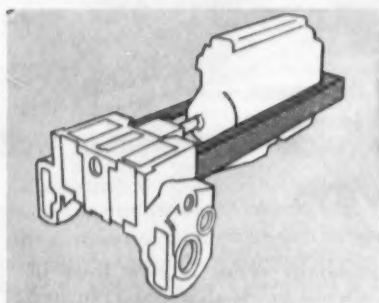
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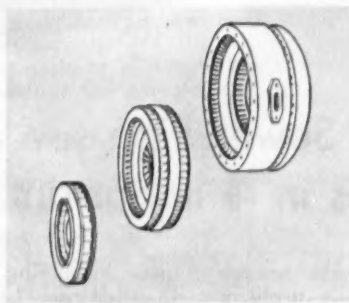
ALLIS-CHALMERS **HD-21**

Engineered to take the **STRAIN**, the **SHOCK**,
and the **GRIND** of Modern Construction



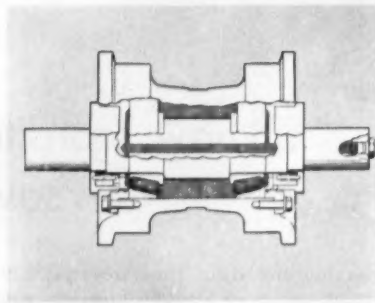
THE STRAIN

The Allis-Chalmers all-steel, Box-A Main Frame soaks up strains . . . does *not* use the engine as a structural member. It allows more efficient equipment mounting, provides excellent weight distribution and makes possible unit construction for unmatched servicing ease.



THE SHOCK

Sudden overloads are common in dozer operations. But hydraulic torque converter cushions shock, protects entire power train. This drive is standard equipment on the HD-21 and has been *proved* on Allis-Chalmers tractors since 1941.



THE GRIND

"Grinding compound" never reaches the truck wheel, support roller, idler and final drive bearings on an Allis-Chalmers tractor. Tapered roller bearings and *Positive Seals* keep dirt and moisture out and hold lubrication in for at least 1,000 hours without lubricating attention.

HD-21

204 net engine hp
Approx. Weight (as illustrated)
51,845 lb

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

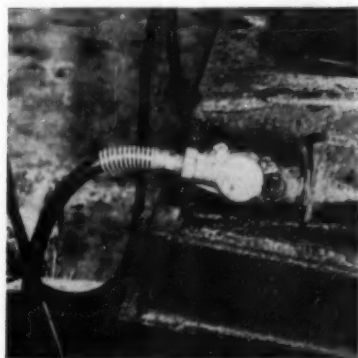
ALLIS-CHALMERS



possibility of erratic welds due to high current surges while working on difficult welding jobs. The chief advantages of constant voltage welding are simplified operation, lower installation and power cost, and X-ray welds for inert gas, submerged arc, and semi-automatic welding processes. These welders are designed to extend these advantages to a variety of applications where it is necessary to change electrode sizes.—Harnischfeger Corp., Welding Div., Milwaukee 1, Wis.



FOR 600 THREAD—Brunner & Lay has added a 600-thread series to their carbide-insert Rok-Bit line. X-design bits are available in 3½, 3, and 2½-in. sizes, as well as cross design bits in 2¾ and 3-in. sizes. The bits fit directly on extension rods without the need for expensive adaptors. Each bit has five air holes—a center hole, two other holes on the cutting face, and two side holes—to facilitate chip removal and to keep the bit from working in its own cuttings.—Brunner & Lay, Inc., Franklin Park, Ill.



REUSABLE FITTINGS—A new air brake hose with detachable, reusable Aeroquip Socketless fittings, is designed for use on tractor-trailer axle brake chambers and tractor service line connections. The socketless fittings which will



Driving batter pile of trestle for the St. Lucie Canal Bridge in Florida. Schedules called for driving 42,000 lin ft of these 33-ft light wall steel pipe piles in 90 days through a tight saturated formation of seashells, sand and marl underlaying the top 6 to 8 ft of matted vegetable matter and sand. Skillful work by the contractor, Paul Smith Construction Company, and the powerful blows of a McKiernan-Terry S5 Single-Acting Pile Hammer powered by a McKiernan-Clayton Steam Generator completed this difficult task successfully within the time limit, with piles being driven at the rate of 30 ft in less than 10 min. driving time. McKiernan-Terry Corporation, 110A Richards Ave., Dover New Jersey.

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big trailer cost
longer loading time**



when **MILLER Tilt-Tops**
can load in 2 minutes! Cost so little!



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Tilt-Top Trailer Co.

457 S 92nd Street, Milwaukee 14, Wis.

Miller Tilt-Top's faster loading, precise easy backing, on-a-dime maneuverability, cuts time between jobs . . . ups your profit—production time for men and equipment every day! One man can tilt, simply drive the equipment onto the broad oak decked platform in less than two minutes! You save the slower loading cost of more cumbersome trailers and tractors . . . are able to choose from several different Tilt-Top models, from 3 to 16 Tons capacity. See these ruggedly built, production boosting Tilt-Tops at your Miller distributor today—you'll be surprised at how little they cost!

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The Efficiency of
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HAS NEVER
BEEN EQUALLED!

USE ONLY GENUINE

Luber-finer
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Plus a Genuine Luber-
finer Pack can give the
Exclusive Patented Fil-
tering Process that has
made Luber-finer The
Standard of The Indus-
try Since 1936!!



**THERE'S A LUBER-FINER MODEL
FOR EVERY TYPE OF ENGINE—
EVERY TYPE OF OIL!!**

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1. REFINING PACK

Introduced to the public in 1935 for use with straight mineral oils, fuel oils, hydraulic oils, and inhibited industrial oils.

2. DIESELPACK

First made available in 1941, the DIESELPACK was primarily designed for use with H.D. detergent compounded oils and has also achieved outstanding results when used with fuel oils and straight mineral oils.

DON'T BE MISLED BY PRICE ALONE!

There is no substitute for DIESELPACK'S Patented Filtering Process for H.D. Compounded oils AT ANY PRICE!

The DIESELPACK cleans more oil faster—keeps it CLEAN longer—and gives more service and better engineered protection than ANY of the substitute filtering elements being offered for Luber-finer units.

IT PAYS TO GET THE BEST!

STANDARD OF THE INDUSTRY SINCE 1936

Luber-finer Units are Standard and Optional Equipment on America's Leading Diesel Trucks, Tractors, Stationary Engines.

Write for Complete Information to Dept. '01

LUBER-FINER, INC.

2514 S. Grand Ave., Los Angeles 7

EQUIPMENT NEWS . . . continued

mate with any standard connection, are available with male pipe swivel, and gladhand connections. They are assembled merely by pushing the hose on the fitting. It will stay on without clamps, bolts, lugs, or sockets. To reuse the fitting, the hose is slit at the fitting, pulled off, and a new hose is easily attached.—Aeroquip Corp., Jackson, Mich.



'57 STUDEBAKERS—The widest choice of engines, models, and gross vehicle weights in Studebaker's history highlights the Transstart line of 1957 trucks. For the first time Studebaker moves into the heavy-duty market with a new two-ton model. Four engines will be offered with the line. They are the 170 and 182-hp V8 power plants, and the 92 and 106-hp six cylinder engines. For the first time, a powerful 170-hp engine is offered with the ½ and ¾-ton models. In the light duty line, wheelbases of 112, 122 and 131-in. will be available with gv ratings ranging from 4,800 lb in the ½-ton model to 10,000 lb in the one-ton model. Pickup bodies will be 6½ to 9-ft long, and they are reported to be the widest of their type. In the new heavy-duty line, wheelbases are 131 to 195 in. with gv ratings of 18,000 and 19,000 lb. — Studebaker-Packard Corp., South Bend, Ind.



NEW CHEVY TRUCKS—Chevrolet's 1957 truck line, on display for the first time this week, boasts three new V8 engines and advances in safety, durability, and performance features. The line ranges from pickups, above, to tandems capable of performing on or off the highway. Eighty-eight models on 22 different wheelbases are available. The three new engines are the 175-hp Super Taskmaster, a 283-cu in. model; the 160-hp Taskmaster V8; and the



Design and Construction of Engineering Foundations JUST OUT!

This book gives you a sound working knowledge of fundamentals, practical techniques, and possible future trends in designing all types of engineering foundations. Covers the full range of foundation work from footings and rafts to cofferdams, bridge abutments, and underpinning. Special aspects of foundations are thoroughly discussed, including mining subsidence; bearing capacity of rock; and moving of complete structures. By F. D. C. Henry, U. of Leeds. 547 pages, 346 illustrations, \$9.00.

Construction Estimates and Costs

A practical book that shows you how to estimate construction costs quickly and accurately. Gives step-by-step instructions for estimating construction work of all kinds, including excavations, all parts of buildings, concrete, structural steel, and material transportation, profit, overhead, etc. Includes many worked-out estimates of typical jobs. By Harry E. Pulver, Professor of Civil & Structural Engineering, University of Wisconsin. 2nd edition, 652 pages, 287 illustrations, \$8.00.

Surveying for Civil Engineers

A manual of advanced surveying techniques covering special instruments, methods, and procedures necessary for large or important surveys. Shows how to pick the method and perform complex surveys at minimum costs. Material is presented by types of surveys, with a full description, theoretical demonstration, and practical example for each topic presented. By Philip Kinsam, Professor of Civil Engineering, Princeton University. 716 pages, 456 illustrations, \$8.50.

Handbook of Rigging

Condensed into this one book are all the tips, methods and techniques essential to more effective practices in industrial and construction operations. Deals with everyday maintenance operations—with the transportation and handling of heavy machinery—with the erection and demolition of smaller size structures. Covers everything from ropes, hoisting chains and hooks, to slings and ladders. By W. E. Rossmagel, Safety Engineer. 321 pages, over 300 illustrations, \$6.00

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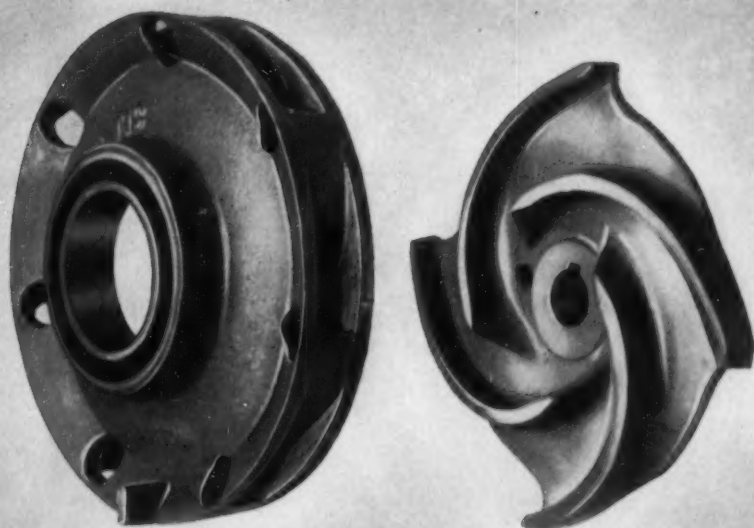
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CM-10



A pump diffuser and a pump impeller. These two parts mean fast, dependable priming and economical rebuilding after long, hard service.

Replacing Two Simple Parts Restores Pump's Full Efficiency

Modern "Diffuser" Pumps Rebuilt Easily, Rapidly, Inexpensively

Metal parts in any pump will wear after hard service, particularly when handling suspended sand or abrasive solids. Therefore, economical rebuilding is essential. In diffuser-primed pumps, rebuilding is accomplished by replacing two simple parts — the diffuser and the

impeller. It is not necessary to replace the expensive pump casing. Full factory efficiency is restored with the replacement of these parts. Replacement of the diffuser and impeller is easy and the parts are inexpensive and readily available.

Diffuser-primed pumps are the only contractor's pumps which offer this cost-saving advantage and also provide the other two essential requirements of self-priming pumps: quick priming action and clog resistance.

Quick priming is obtained in Marlow Contractor's Pumps because the diffuser provides a multiplicity of priming points. Each vane in the diffuser performs this function. With at least six vanes in the Marlow pump, it tends to separate air faster, thus priming more rapidly.

When a Marlow is primed, water is discharged through all diffuser ports around a full circle. Dirt and debris cannot accumulate because its 360° cleaning action clears clogging accumulations at the base of the pump casing. There are no dead segments to hold muck and silt which reduce pumping efficiency.

Diffuser-primed pumps are fast priming, resistant to clogging and economical to rebuild... and only a Marlow pump is diffuser primed. Ask your dealer to show you Marlow Contractor's Pumps and the two inexpensive replacement parts. They mean better pumping and greater economy to you.



This is "diffuser priming." Note the 360° cleaning action and the "multiple point priming."



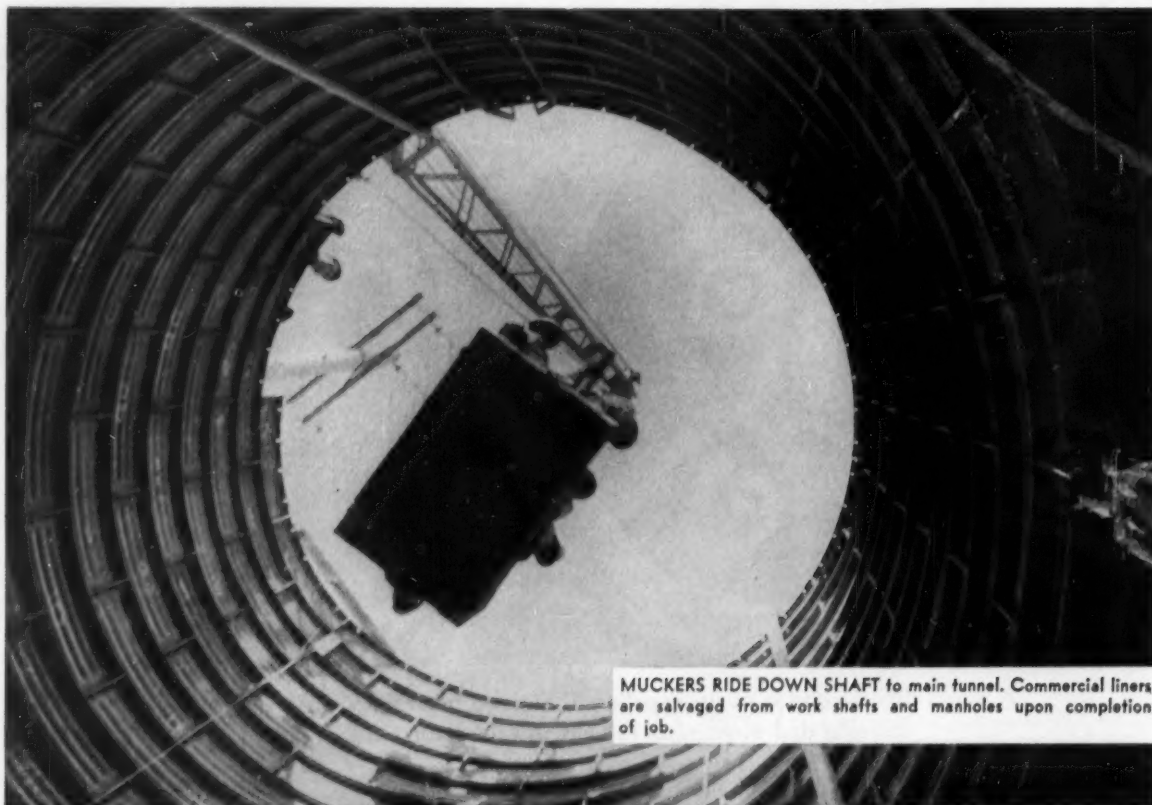
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MARLOW PUMPS

Division of Bell & Gossett Company
MIDLAND PARK, NEW JERSEY

Morton Grove, Illinois

Longview, Texas



MUCKERS RIDE DOWN SHAFT to main tunnel. Commercial liners are salvaged from work shafts and manholes upon completion of job.

Inside Bolting of Commercial Liner Plates and Ribs Speeds Sewer Tunnel to Early Completion . . .

● A major factor in the speedy construction of the Central Schuylkill East Side Interceptor System of Philadelphia is the use of Commercial steel liner plates and posts.

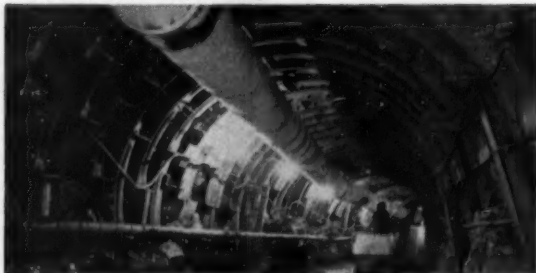
Four thousand eight hundred feet long and averaging thirty-five feet below the surface, this tunnel passes under railway lines and heavy city traffic . . . demanding roof support of maximum strength.

To provide the needed strength, safety, ease of handling and simplified installation, Commercial Shearing steel liner plates and posts were installed. Bolted from inside the tunnel with only a "spud wrench," Commercial liner plates and posts could be installed faster than any other support, even by unskilled work crews . . . an important safety factor when working in unpredictable earth and rock formations.

Commercial steel liners bent to suitable radii for tunnels or shafts four feet or larger in diameter, are available in thicknesses 1/8" to 3/8". For complete details on how you can cut days off your tunnel completion schedule, write to Dept. B-4. The Commercial Shearing and Stamping Company, Youngstown, Ohio.



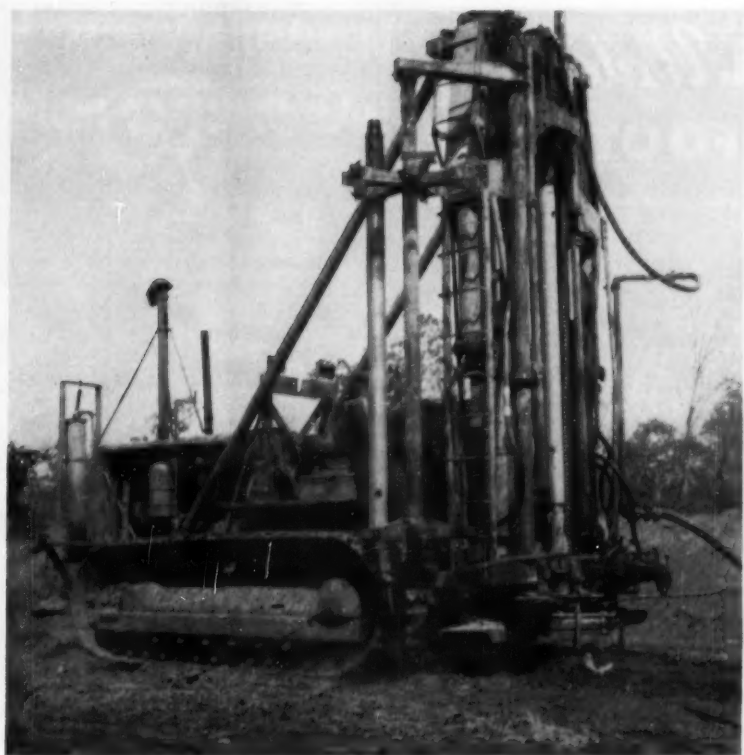
HEADING AND BENCH TUNNELING—removing hard bench, muckers move ahead. Commercial combination radii liner plates are in place in soft top heading.



MIXED FACE TUNNEL SUPPORT—liner plates holding unstable ground in top heading are pinned and supported on steel posts bearing on stable ground.

COMMERCIAL
shearing and stamping

YOUNGSTOWN, OHIO
CHICAGO, ILLINOIS
SALT LAKE CITY, UTAH



EARLY MODEL of the drill is a shop-built job and looks a little cluttered. But in tests it proved fast and efficient. Rig is shown here mounted on a Cat D8 tractor.



LATE MODEL, mounted on an International TD-24, incorporates engineering refinements.

New Rotary Drill Works Fast

HERE'S A NEW DRILL you're likely to hear more about. It's a tractor-mounted rotary drill with mechanical drive, hydraulic controls, and very high drilling speeds in all sorts of rock.

Robbins Coal Co., Oneonta, Ala., developed the rig to drill blast-holes in overburden. The drill was so successful that the firm set up a separate corporation—Robbins Machine & Manufacturing Co., Inc.—to manufacture and market it.

About 10 of the new drills now are in operation, several of them on construction jobs. A. E. Burgess Contracting Co., Jasper, Ala., bought one of the first. A. E. Burgess, president of the firm, says the Robbins drill cut in half the time needed to produce 35,000 cu yd of highway base material from soft sandrock. Burgess says wagon drills would have taken six weeks; the new rotary did the job in three weeks.

He estimates that one Robbins drill will replace four wagon drills.



CHANGING STEEL is fast, easy because the drill mounts a revolving rack that holds six lengths of drill pipe. Note the hydraulic jacks that level the tractor for drilling.

On one of his own jobs, a Robbins drill mounted on a Cat D8 with a compressor and a driller and helper replaced two wagon drills, three compressors, two jackham-

mers, one small half-track rotary drill, and nine men.

Burgess has tried the drill in just about every type of rock found in Alabama except hard

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*Tops... in
Protection,
Comfort,
Long Wear!*



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Durable, full-cut garments, in rubber, oiled and latex constructions, for every kind of wet-weather work. Made of selected materials, with exacting craftsmanship, they are guaranteed waterproof, assuring complete protection from the elements. Reinforced where extra strength is needed, without impairing comfort and full freedom of movement. Available in a variety of styles, in all sizes. No. 338 Coat is an old-time favorite—double back; corduroy-lined collar; 49" long.

SUITS—

Style 80 Jacket with Style 81 Overalls makes the ideal shaft suit. Other jacket-and-overall suit combinations to meet every preference or job requirement.

SAFETY HATS

"Hardboiled" Safety Hats in fibreglass or aluminum. Light weight and comfortable, yet providing greatest possible head protection. Exceed highest established requirements for strength, heat and moisture resistance, and dielectric tests.

"TOE-SAVER"® BOOTS

Smooth, tough, flexible black rubber, heavy duck lined Cushion insole. White cap over reinforced steel safety toe tested to withstand 2,000 lbs. pressure. Treaded soles. Hip, Storm King and Short. All permanently marked size numbers.

The "Toe-Saver" feature is also available on a variety of work shoes, and on our "Contractors" Mucker Boot.



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ROTARY DRILL ... continued

granite. He reports that its drill speed is about 1 fpm in hard blue sandstone and as high as 6 fpm in softer formations.

The manufacturer claims it has reached speeds of up to 15 fpm in soft shale and as much as 100 ft per hr in average hard sand-rock. Robbins says the rotary has an average drill speed of 68.6 ft per hr in hard blue sandstone, hard shale, and abrasive red shale. The churn drills Robbins formerly used averaged 6 to 9 ft per hr.

The rotary has a maximum drilling depth of 65 ft. A revolving rack on the drill holds six lengths of drill pipe to make steel changes easy.

Power comes from the rear power takeoff of the tractor through a Fuller K8 or K11 transmission that drives a square shaft running the height of the drill unit. The square shaft powers a sliding box gear which rotates the drill steel at speeds of between 25 and 120 rpm.

Two 8-in. hydraulic cylinders operating off a 70-gpm hydraulic two-stage pump obtain down pressures on the drill bit of as much as 60,000 lb. The hydraulic pistons operate a rack and pinion that raise and lower the drill pipe by two chain sprockets. Rate of hoist is 65 fpm; rate of feed is 40 fpm. Three jacks level the tractor for drilling.

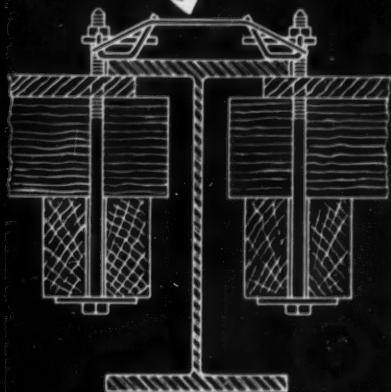
A 600 cfm air compressor—which may be mounted on the front of the tractor—forces air into the drill pipe to blow chips and dust away from the drill bit. Some of the dust packs in cracks in the blasthole to make its sides clean and smooth; the rest is thrown out at the surface by a dust deflector.

The 225-gal hydraulic system has a tank capacity of 150 gal. The pump maintains a flow of 70 gpm through the system. A disc-type filter in the system and a metal screen filter in the hydraulic tank protect the system.

The drill masts are 15 or 20 ft and hinged so that they can be broken over quickly to make the unit portable on a low-boy. On the latest models, supporting braces are swiveled so that they need not be removed for the break-over.

Total weight of the drill with a 15-ft mast is 42,000 lb; overall height is 23 ft. With a 20-ft mast, the drill weighs 44,000 lb, and its overall height is 28 ft. Both units are 8 ft wide.

**Faster Adjustment
from TOP of Deck**



TOTAL SAFE LOAD ON BOTH COIL BOLTS
IS 10,000 LBS., OR 5,000 LBS. PER BOLT

... WHEN HANGING FORMS WITH

SUPERIOR PLATE HANGER FRAMES



With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from *above* the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only $\frac{1}{2}$ " above the flange.

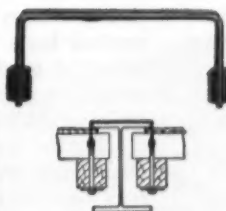
FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

STANDARD COIL HANGER FRAME



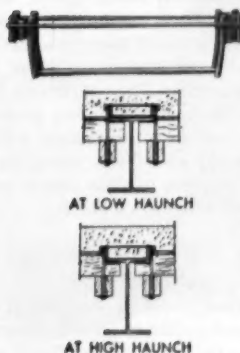
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior Standard Hanger Frames. Detail at left shows their use with double ledgers, $\frac{1}{2}$ " coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

COIL BEAM SADDLE



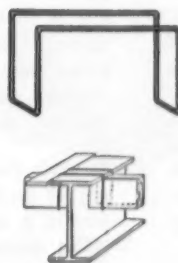
On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each $\frac{1}{2}$ " Coil Bolt. Coil Beam Saddles are also furnished for $\frac{3}{4}$ " and 1" bolts.

SPECIAL HANGER FRAME



The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior Special Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the $\frac{1}{2}$ " coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per $\frac{1}{2}$ " bolt.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office

1775 Broadway, New York 19, N. Y.

Pacific Coast Plant

2100 Williams St., San Leandro, Calif.

Improved D Tournapull



Now 9 yards heaped - and roadable without permit

Improved to meet your request for reduced width for roading without bothersome permits and bigger scraper capacity. The improved handyman D Tournapull can increase your profits on small yardage production assignments, cut costs on pioneering and clean-up, maintain haul-roads and drainage to speed production dirtmovers. It will cut lost time for heavy production equipment by handling emergency hit-and-run assignments.

New capacities for the improved D Tournapull measure 7.3 yards struck and 9 yards heaped.

Overall width has been reduced to 8', so it can be roaded anytime without permit on highways requiring 8' maximum clearance.



Axle-loads are well under the 9-ton roading limit. *New tailgate* eliminates "fall-over" of material. *Higher apron lift* gives easier ejection to sticky or bulky material. Operator has better load visibility. Many other improvements have been built into the D Tournapull over the past 9 years, as a result of experience with more than 3000 "D's" working in all parts of the world.

Speeds to 29.5 mph on rubber allow it to travel anywhere... work faster... move more earth in less time than bigger tractor-scraper combinations costing thousands of dollars more than the "D".

It loads itself, or can be push-loaded. It hauls earth and other materials a hundred feet or several miles economically. Optional handy 8' dozer blade lets you take care of miscellaneous dozing jobs.

Here are some of the ways D Tournapull can make your investment dollars go farther:

1. Handles wide variety of jobs

Do-it-all "D" does pioneering, ditching, rough-grading, backslapping, spreads gravel and topsoil, speeds through dozens of other

clean-up or small yardage production jobs. Its easy mobility and maneuverability (90° turn) make it ideal for subdivision grading, landscaping, and for building driveways, streets and alleys. Versatility makes "D" an economical tool to use on many kinds of work now done with crawlers, bigger units, or several special tools.

2. Works alone or in fleets

Tournapull self-loads, hauls, and spreads... can handle the complete earthmoving operation. "D's" can also push-load one another in fleet operation... or it can be pushed by tractor or motor-grader. It can also work profitably, when not needed elsewhere, along with bigger scrapers in your heavy production earthmoving fleets.

3. Travels fast around the job, between jobs

You don't need a permit or a truck-and-trailer to haul D Tournapull to its assignments. There are no loading and unloading delays. Mobility allows "D" to reach any assignment on the largest project in just a few minutes, 5 miles is less than 15 minutes away. And the improved D Tournapull, meeting 8' roading clearance and 9-ton axle-load limit, can "run" from job-to-job at a moment's notice

via highway, on crowded city streets, or across open country at travel speeds to 29.5 mph.

4. Outproduces crawlers

Three to four times faster speeds allow "D" to match and often out-work crawler-scraper teams costing 20 to 40% more. With precision push-button control, "D" does finishing work faster, easier.

5. Works in soft going

Exclusive Tournapull differential transfers power automatically to gripping drive-wheel when other wheel starts to slip. You get better traction in muck, sand, soft material, ruts, and throughout haul cycle for dependable performance under toughest job conditions.

6. Turns in less space

Compact design, power steer through geared king-pin, full 90° turn, enable "D" to work in restricted quarters and on narrow fills. Jack-knifing is eliminated. 2-wheel prime-mover concentrates weight on drive wheels for better traction in soft going.

7. Lowers maintenance costs

Replacing the 450 to 500 moving track parts of crawler with Tournapull's 4 rubber-tired wheels naturally reduces your repair costs. Power travels all the way on enclosed anti-friction bearings, al-

ways lubricated, always sealed from dirt. There is less friction, less wear, less lubrication cost.

8. Less weather delay

Big, low-pressure, 18.00 x 25 tires give good traction in soft going. Exclusive power-transfer differential, 90° turn, and geared king-pin power-steer allow "D" to "walk" out of trouble. Tournapull works where other rubber-tired earthmovers stall. It's a handyman that's ready to clean up odds and ends of tough going that hold up big production tools. On many jobs a "D" can pay for itself in a single season by just maintaining good drainage and fast haul roads.

9. Safe and easy for operator

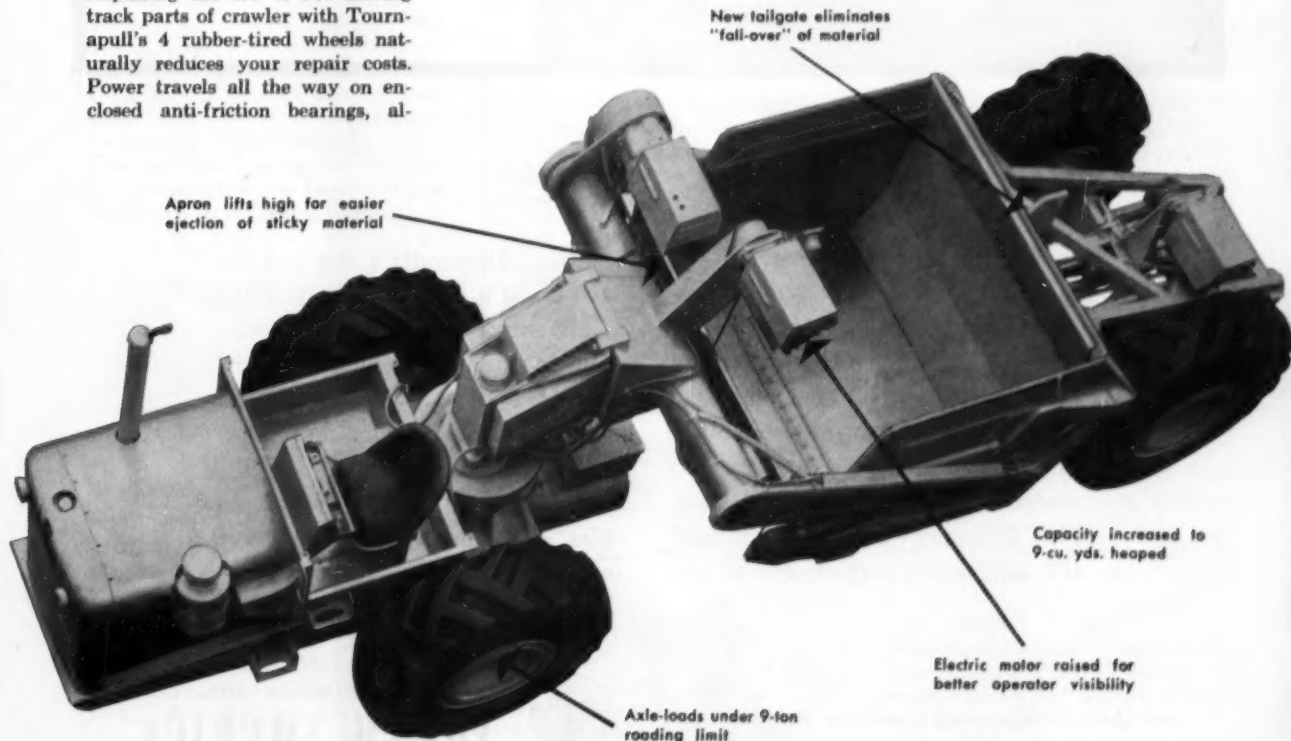
Big disc-type air-brakes on 4 wheels (2,822 sq. in. braking surface), power-steer, trouble-free finger-tip electric controls, low-pressure shock-absorbing tires, bucket-type safety seat... all make busy work-days easy for operator. "D" safely travels steep grades, narrow fills, in close clearances, around sharp corners, and through city and highway traffic.

10. Interchangeable equipment

Scraper interchanges with other hauled units... rear-dump, side-dump, or flat-bed haulers. There is also a 10-ton lift-and-carry crane, a winch-and-arch for skidding poles, logs, pipe. Dozer-blade or snow-plow attaches to front-end. It's easy to keep handyman "D" always busy.

Check the work you have ahead, and your equipment, to see how this fast, versatile "D" can fill a gap in your earthmoving fleet. Then, write or 'phone for complete details on the new D Tournapull.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-1275-G

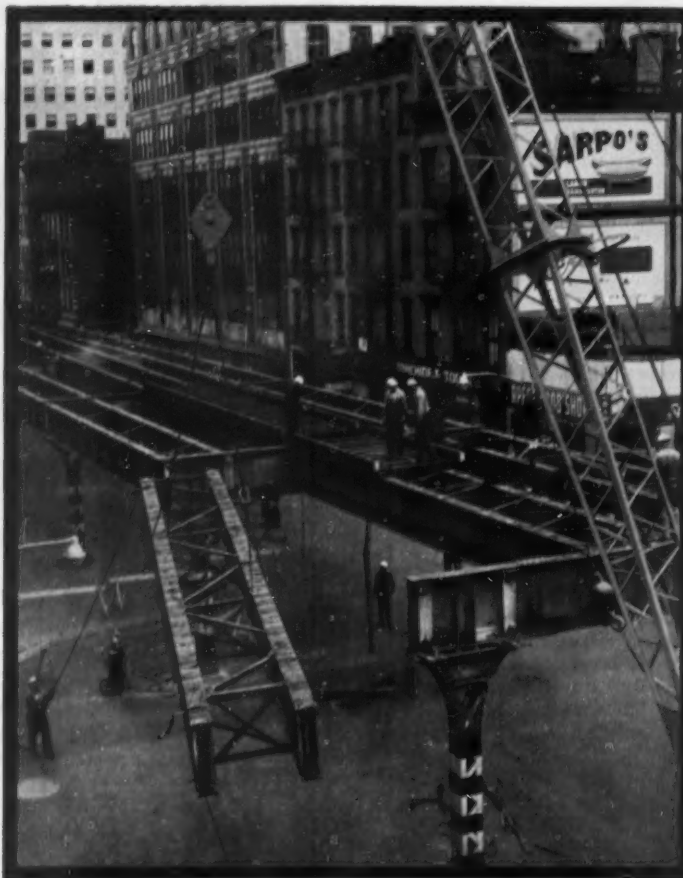


LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Extra Value makes the difference in Contract Bonds

DEMOLITION of the 3rd Avenue El adds to New York's beauty and municipal pride. Indemnity's individualized bonding service covered this job. The same type of service is available for your surety needs, large or small.

Indemnity of North America has the financial capacity and the experience to furnish bonds covering projects of practically any size or description. A good example is its part in the demolition of New York's 3rd Avenue El, a long-awaited modernization project on the East Side. Indemnity's Bond guaranteed the contractor's performance as per

contract. Indemnity's size and the extent and diversity of its activity in the surety field enable the company to maintain a high standard of service that is dependable and efficient. All this means 'Extra Value' in bonding facilities and, for contractors who qualify, preferred rates* and prompt attention to their requirements.

*Not available in Louisiana and Texas

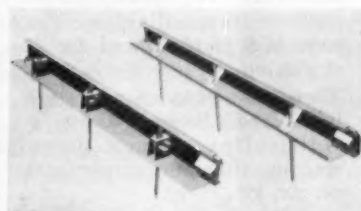
*One of the North America Companies which are headed
by Insurance Company of North America, founded 1792*



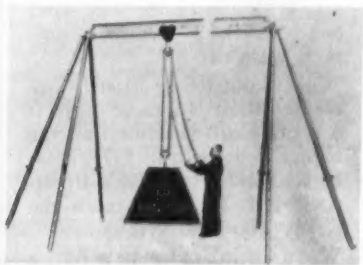
Protect what you have

INDEMNITY INSURANCE COMPANY OF
NORTH AMERICA
Philadelphia

322 cu in., 210-hp Super Loadmaster. Offered as standard equipment on some of the larger models is the 196-hp Loadmaster V8, introduced last year. Eight transmissions, including an automatic drive for virtually every model, are teamed with the wide choice of engines. Safety features include interlocking latches on all side doors and steering wheels with hubs recessed 3 in. below the rim. Full air brakes are offered on many models. — Chevrolet Motors Div., General Motors Corp., General Motors Bldg., Detroit 2, Mich.

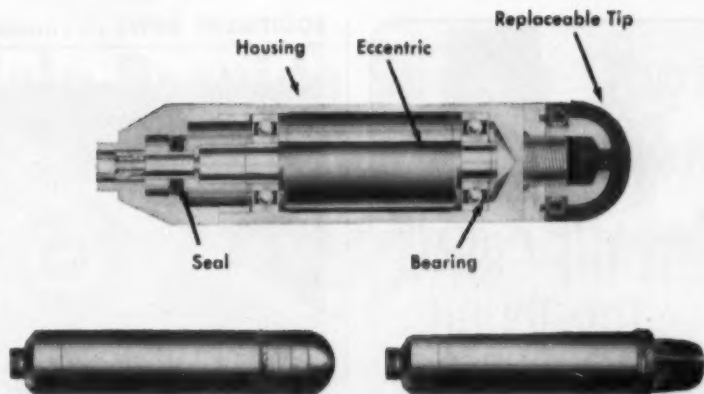


ALL-PURPOSE FORMS — General's new line of general purpose road forms is available in both single and double wedge lock types. They are designed with tapered sliding lock joint connections for quick, positive alignment, and these connections are used to reinforce form threads when necessary to prevent tread distortion. Most popular sizes are carried in stock for quick delivery. — General Road Machines, Inc., Niles, Ohio.



LIGHT AND ADJUSTABLE — The Magic-Pole floating gantry uses high strength aluminum alloy I-beam construction and tripod legs that adjust as much as 7 ft. Models now available range in height to 17 ft, and in length to 20 ft. Maximum capacity is two tons. They can be set up quickly by one man under most conditions, and can even be mounted on a truck bed. — B. E. Wallace Products Co., Exton 20, Pa.

(Continued on next page)



SIMPLE DESIGN — Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel cast tip at right.

Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate—simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard

equipment, with 3-finned steel cast tip optional.

Viber heads are light weight, ranging from 6 to 16 pounds... 11 to 12 inches in length and are available in four diameters—1¾ in., 2½ in., 2½ in. and 3 in.

Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air... easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.

Viber Replaceable Rubber Tips

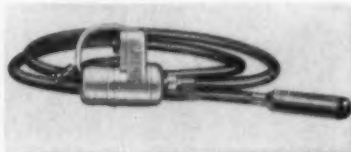
Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

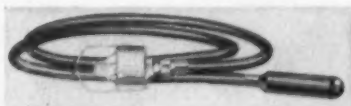
For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. 8E10.



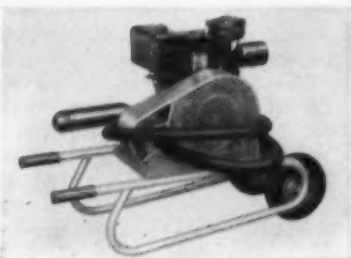
VIBRATORS SINCE 1931



Model E Electric



Model P Pneumatic



Model G Gasoline

COMMENT

from the
BUTLER ENGINEER

Of Wheelbarrow Batching and Non-existent Ready Mix

Planning for the Road Show put my mind in a reminiscent gear . . . the days when batching was done by piling materials in long windrows: so many wheelbarrows of sand, so many of stone plus a couple of bags of cement—as an afterthought. This hash went to a steam-driven, steel-wheeled paver—remember?—The boys laid planks ahead for it to run on.

Then came wooden aggregate bins that discharged (still volumetrically) to mule drawn wagons. Bins were carpentered on the job.

The founder of this company, (Mr. B for short) was then a paving contractor. He developed a bin gate that had a unique characteristic: it worked. Then he designed a batcher and a steel bin . . . Mr. B paved in summer, built bins in winter—and pioneered in *weighing* batchers in both seasons.

Next development: bulk cement and great coyness by the engineers to accept it. So Mr. B and Company developed the *interlocked batcher*. Supervisory opposition said, "OK—and our blessing." Pretty important, wasn't it!

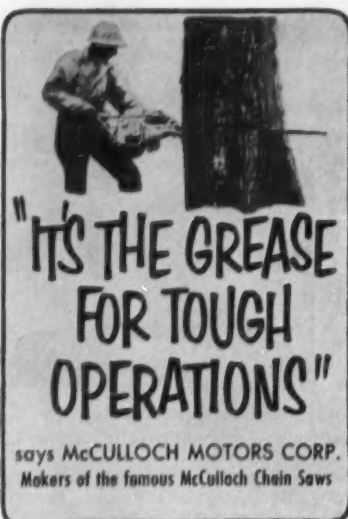
What about Ready Mixed Concrete? Man! In those days it was as non-existent as the babies to be born in 1977. Maybe that industry owes a tip-of-the-hat to Mr. B. I mean the Ready Mix industry.

When I think of the new Butler 0-1-0 one man operated, automatic Roadbuilders Plant and its calm command of 2 hungry 34E dual drum pavers . . . and of punched-card batching for Ready Mixed Concrete, I see how far we've come since my whiskers were fuzz.

Want more history? Write to

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



"We tested all types and makes of lubricants for the Zerol gears in the transmission. The one grease selected for long, tough operation was LUBRIPLATE. Now that we have produced thousands of McCulloch Chain Saws, we more than ever recommend the use of LUBRIPLATE Lubricants in our tools."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



METAL STAKES—In the long run, Universal's all-steel construction stake will probably save you money. It's sure to save you time. Constructed of 3/4-in. round cold rolled stock, the stakes are easy to drive and practically indestructible. The short, sharp point provides for fast driving. Nailing holes are provided on one-in. centers to permit nailing at any point to footings or forms. Standard lengths are 24, 30, and 36-in., and longer sizes are available on special order.—Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.



THREE-IN-ONE TOOL—Rockland's new stumping block can be used as a digging, splitting, or battering ram tool. Available to fit any size crawler-tractor, the block mounts on a land-clearing rake or a dozer blade by means of pins that may be easily removed when the block is not needed. The teeth of the tool are shaped to grip into the base of a tree stump, thus preventing unnecessary skidding and wear on the tractor. Prices are based on the drawbar hp of the tractor: 40 to 50 hp for \$53; 50 to 70 hp for

Anchor Bolts Help Provide Secure Roof in New Tunnel on Turnpike Extension

One of the features of the Northeast Extension of the Pennsylvania Turnpike will be the 4500-ft-long tunnel which is now under construction in a mountainous area near Bowmans-town, Pa.

To help provide a sound roof the tunnel contractor, Lipsett Inc., New York, is installing approximately 900 Bethlehem Rock Anchor Bolts in the overlying strata. The slotted bolts, each 5 ft long and about 1 in. in diameter, are used in conjunction with steel wedges and square anchor-plate washers. In some areas, 12-ft roof ties are also used.

In addition to the slotted anchor bolt, Bethlehem produces a $\frac{3}{4}$ -in. diam headed anchor bolt, which is used with a leaf-type expansion shell. Both the slotted and headed bolt come in varied lengths. They are ideal for supporting tunnel roofs, and for minimizing rock slides along highways, because of the effective way they bolt together the stratified slabs of rock. In addition to providing an excellent means of reinforcement, they also help to minimize maintenance costs.

Depending upon the type of rock face, Bethlehem Rock Anchor Bolts can be used with anchor-plate washers, angle washers, or steel ties. If you have any question about rock control in tunnels, or at danger areas along highways, drop a line to the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM
STEEL



(Advertisement)

Contractor Facts in Photos...



And Away It Goes!

Another load moves on the Massachusetts Turnpike in this 31-ton Athey PR21 Rear Dump Trailer owned by Gilbane Building Co., Providence, R. I.

With low center of gravity and "universal-joint" tractor-trailer maneuverability, the Athey-Cat unit turns shorter, dumps faster, works around shovel easier than rigid-frame trucks.

Takes Rock As It Comes!

Big rock is no problem for Berlanti Construction Co. on the Massachusetts Turnpike. Their three Athey-Cat PR21-DW21 Rear Dump units are built to take the shock of rock loads. 23-second, positive, hydraulic dumping, and Athey body design, sheds material quickly, assures high production.

These are some of the reasons why more and more contractors are using Athey-Cat equipment. Check with your Athey dealer for more facts on the Athey-Cat PR21-DW21 Rear Dump Trailer.



Moving 800 Tons Per Day!

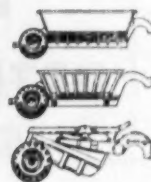
Near Sturbridge, Massachusetts, Henley Lundgren Co. used three Athey-Cat PR21-DW21 Rear Dump Haulers to move blasted rock on turnpike construction. At the rate of 800 tons per day, this 22½ cu. yd. "all-material" hauler stepped up shovel production, increased output, finished jobs on schedule. Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

See You at the Road Show, Chicago
Jan. 28 - Feb. 2, 1957



Athey

... world's finest rubber-tired trailers!



EQUIPMENT NEWS . . . continued

\$65; 70 to 90 hp for \$79; 90 to 110 hp for \$98; and over 110 hp for \$118. They are available through Allis - Chalmers, International, Oliver, and Terratrac dealers.—**Rockland Allied Equipment Co.**, 3778 W. Colonial Drive, Orlando, Fla.

WARNING LIGHT—The Radar-Flash emergency light, powered by a unique two-in-one dry battery incorporating two 6-v lantern batteries wired in parallel, flashes a red signal that is visible for over a mile. The light-head attaches to the battery case with two simple screw caps; no wires or spring contacts are needed to make the electrical circuit. Over 50 hr of continuous flashing is provided by the battery. A heavy steel carrying handle doubles as a protecting bar to prevent accidental damage to the light.—**Burgess Battery Co.**, Freeport, Ill.



MONORAIL HOIST—A new idea in roof hoists, using the monorail principle, will lift 200 lb at a rate of 150 fpm. The unit, including the power supply, is mounted and operated on the roof. After the load is lifted up the side of a structure, the entire hoisting mechanism and the load are moved back horizontally from the edge of the roof for safe unloading. This trolley movement covers 5½ ft. Set-up with hand tools in five minutes, the hoist has an all-welded tubular frame with front and back legs that adjust to compensate for roof pitch. The compact unit is handled in two parts; a frame weighs 120 lb, and the power unit weighs 90 lb with an electric motor, and 100 lb for a gasoline engine. — **Reimann & Georger, Inc.**, 1837 Harlem Rd., Buffalo 12, N. Y.

MIL-CARB* carburized WASHERS

®Trade-Mark

are on this Job,
too . . .

Wherever there's a high-strength bolted construction project going on today, the chances are better than even that you will find MIL-CARB Carburized Washers on the job, such as the one shown here, for which bolts, nuts and washers were supplied by **Russell, Burd-sall & Ward Bolt and Nut Co.**, Port Chester, N. Y.

To quote Mr. John S. Davey, Vice President: "Bolting this year will account for 15% to 20% of all construction, whereas two years ago it was a very modest percentage of the total. The economies to builders and contractors have already been demonstrated; the advantages to the public in avoiding the din normally associated with new construction is evident from scientifically conducted and tabulated noise tests, indicating that bolting decibel ratings are less than half those of riveting."

And because no bolt assembly is any better than its washers, high strength bolting should include the use of MIL-CARB Carburized Washers to prevent "galling" or grinding of the washer . . . essential to permanent, uniformly strong, tight joints.

MIL-CARB Washers are fabricated from Prime Carburizing Quality Special Soundness Steel to insure uniform quality control, always equal to or exceeding the rigid specifications for high strength bolted steel construction.

For uniformly sound construction, specify
"MIL-CARB" Washers and accept no substitutes.

Since 1887



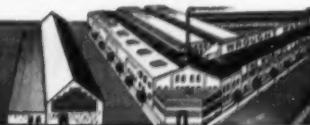
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UNITED STATES STEEL CORPORATION**
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MANUFACTURING CO.**

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That Satisfies Everyone

This remarkable Rogers trailer meets rigid requirements laid down by Frank W. Hake, heavy hauler of Philadelphia, Penna.

It incorporates ideas submitted by a large company for whom Hake's organization handles many heavy hauls of which this 91 ton transformer is an example.

It is significant in the unusually low weight imposed on the highway.

This is an example of how this organization of long, specialized experience can interpret a new and difficult problem and develop a product to meet these exacting demands.

Whether you need a special or a conventional trailer, contact Rogers. Then if you investigate thoroughly, we believe you'll "Choose a Rogers." Write for the new catalog.



SPECIFICATIONS

Length overall.....	106 feet
Width	12 feet
Height with Load.....	17½ feet
Number of tires	36
Total Weight.....	241 tons



The LT Trailer made of alloy steel for lightness with strength.

ROGERS BROS. CORP. ALBION PENNA.

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Macks are popular on the St. Lawrence Seaway... and for good reasons—their bonus capacities, sure-footed traction, and dependable power pay off. (Right) A Mack lineup ready for work on...



The St. Lawrence Seaway... a big job for big trucks...

...a job for a lot of heavy-duty Macks—that's the conclusion of Miron & Freres, Limited, the contractor working on the Cote St. Catherine section of the St. Lawrence Seaway. They are using Mack off-highway dumpers exclusively, over 30 of them, for their big earth-moving job. And their big Macks are paying off for them in real hauling efficiency—plenty of power for big payloads with

minimum maintenance costs... even during winter operations.

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clusive Power Divider—the four-wheel tandem drive that delivers power only to the wheels with traction—make Macks the logical choice for getting jobs done on schedule, and at a profit.

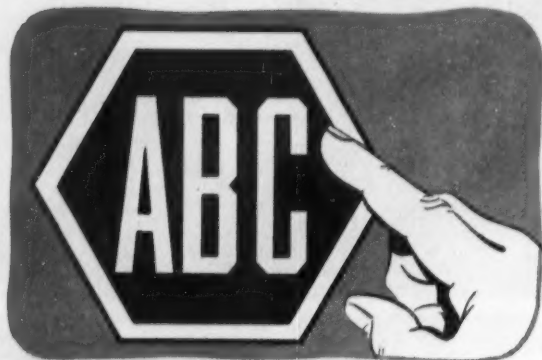
For full details, see your Mack Branch or Distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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HOW TO HANDLE WET JOBS

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Contr.: Owen-Ames-Kimball



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IN ONE MONTH from installation, the concrete base slab (4 ft thick, 71 ft diameter) was completed—deep down at 35 ft below water level. Half month more finished monolithic circular wall, 40 ft high.

Such were the speeds and savings made possible by Griffin Wellpoint equipment, plus Griffin's long-acquired “know how,” which assured correct wellpoint depths, spacings and jetting methods, on this tough-to-handle job.

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to coordinate all contracting operations including reviewing, analyzing and making recommendations on contract work requirements, prepare contracts and supervise contract fulfillment.

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Electrified for continuous high speed production... the AUSTIN-WESTERN 61-E crushing and screening plant

Here's a single pass, portable crushing and screening plant that operates continuously at *full production speed* to deliver a constant flow of uniform product at low operating cost. It's the Austin-Western 61-E... *electrified* to make it the perfect plant for contractors, counties or townships... on big jobs or small.

Individual electric motors (powered by a diesel driven generator) operate feeder, conveyors and double deck screen through short-coupled V-belt drives. There's no mechanical loss from inefficient gear boxes and open chain drives. The result is maximum operating efficiency for low-cost, high-volume production.

What's more, the 61-E plant is easy to move, simple to operate and maintain because of design and construction extras like these:

- No jacks are required because the heavy welded frame and dual rear wheels give complete stability.

- Push button electric operation eliminates clutches and clutch control levers.
- Electrical hook-up is simplified by using standard motors and control units, and by the elimination of complex wiring systems.
- The single-jaw crusher operates at high speed because it is supported on a heavy forged chrome-vanadium steel shaft mounted in over-sized self-aligning bearings.
- Positive protection against uncrushable material is assured by machined toggle plates in the crusher.

It will pay you to see this plant for yourself at your nearby Austin-Western Distributor. Or, to get detailed information, send for our new 61-E booklet containing complete specifications. Write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Optional equipment like this new Portable Bin and Screen Unit, ideal for producing specification material, makes the 61-E one of the most versatile plants available.



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Methods Memo . . .

World's Record

Collins Construction Co. of Port Lavaca, Tex., set a world's record for submarine pipeline installation by laying 12 miles of 10½ in. dia concrete-coated steel pipe across Corpus Christi Bay in just 80 hours.

Collins crews began installing the pipeline Thursday morning, September 13 at 4:30. Working 16 hours a day, they completed the line at 4:30 Monday afternoon, September 17.

The previous record for submarine pipelines was established in 1953 by J. Ray McDermott in the offshore waters of Louisiana. McDermott installed 55,000 ft of 10½ in. dia pipe in 14 days.

Collins assembled 4,000-ft sections of the pipeline on the shore and winched the line across the bay, welding on new sections at the shoreline. Pontoons attached to the pipe sections gave them slightly negative buoyancy so that the work was not impeded by winds that ranged as high as 35 mph.

As many as three of the 4,000-ft sections were placed daily. But S. V. (Sammy) Collins, president of the firm, estimates that he could have laid a mile of the line each hour if it had been necessary. "The cost of laying the marine pipeline," Collins said, "compares very favorably with that of lines of the same quality and diameter laid on dry land."

The pipeline will carry natural gas from a Humble Oil Co. plant to the Reynolds Metals Co. plant at La Quinta. Fred Wakefield was launching superintendent, F. T. Glascock was general manager, and Jean Johnson was general marine superintendent.

Mechanized Construction

Selling construction equipment is one of the fastest growing businesses in the U. S. The number of construction and mining equipment distributors increased 551% between 1929 and 1954 while the number of all business firms rose only 38% and the number of contract construction companies went up 74%.

The Bureau of the Census says there were 1,640 equipment distributors in 1954 compared with only 252 in 1929. The biggest increase has come since 1948. There were 404 distributors in 1939 and 906 in 1948.

The increase in equipment sales since 1929 is still more impressive. Total sales in 1954 were nearly 25 times the 1929 volume — \$1.4 billion against only \$56 million. Again the biggest increase has come since 1948 when equipment sales totalled \$780 million.

Distributors counted in the study include only firms that employ one or more persons and are primarily engaged in selling construction and mining equipment. Manufacturers' branches and sales offices are not included.



A Perfect Record

Here's a safety record to be proud of. In the 691 days from first excavation to final clean-up, not a single employee suffered a disabling injury in construction of the \$4 million American Hardware Mutual Insurance Co. home office in Minneapolis.

It is the first major building ever erected in the Minneapolis-St. Paul area without a disabling injury. Over 750,000 man-hours of work went into its construction. On the average, that size and type job would produce 23 disabling injuries.

In the picture, J. E. Hanson (left), president of the insurance company, congratulates Ollie Houvie, superintendent of construction, and George Drake of Johnson, Drake and Piper, the contractor.

Tom Lively, the consulting safety engineer on the job, will be one of the speakers at the sessions of the Construction Section at the National Safety Congress in Chicago on October 22 and 23.

St. Lawrence Bridge

U. S. and Canadian St. Lawrence Seaway officials now plan one high-level suspension bridge across the south channel of the river between Roosevelt Town in the U. S. and Cornwall Island instead of the four smaller structures called for in earlier plans.

Lionel Chevrier, president of Canada's St. Lawrence Seaway Authority, says the high-level bridge will cost \$6 million, about \$2 million less than the four smaller bridges. Canada will build the substructure, and the U. S. will add the superstructure. Completion is scheduled for July, 1958.

An agreement with the N. Y. Central Railroad paved the way for the decision to build the high-level bridge. The railroad agreed to abandon its 57-mile Cornwall to Ottawa line which crosses the channel on a bridge that must be removed.



Dallas Memorial Auditorium
 Archt.-Engr.: George L. Dahl, Dallas
 Const. Engr.: Amman & Whitney, New York City
 Gen. Contr.: R. P. Farnsworth & Co., New Orleans-Dallas

how architects employed **POZZOLITH** to get desired concrete results

ARCHITECTS and ENGINEERS employ **POZZOLITH** with confidence

★ proved performance...130 million cubic yards of concrete produced with Pozzolith for all types of jobs.

★ applied know-how...more than 85 skilled Master Builders' field technical men for product-use consultation.

★ available everywhere...over 1000 ready-mix and job-site plants now producing concrete with Pozzolith.

Concrete with lowest possible unit water content and good workability was specified in the construction of this \$8,000,000 Dallas Memorial Auditorium.

A prime requirement was control of rate of hardening under summer and winter job conditions to provide uniform workability and uniformly high 48-hour strength for the lightweight concrete of the dome.

These requirements were met with Pozzolith. Pozzolith with its adaptations is key to the control of:

1. *water content*...makes possible lowest unit water content for a given workability.
2. *entrained air*...provides optimum air content without sacrificing other desired qualities.
3. *rate of hardening*...gives desired handling and finishing time under widely varying job conditions.

Ask us to demonstrate the full advantages of Pozzolith for your project.

COLORED MOTION PICTURE, "The Man with The Trowel", shows how Pozzolith greatly improves your control of concrete quality. Film available for private showing to groups of any size.



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Under many drilling conditions you, too, can get the greatest saving with Timken multi-use bits. They will give you the lowest cost per foot-of-hole when full increments of steel can be drilled in ordinary ground.

But multi-use bits may not always be your best bet.

In hard abrasive ground, for instance, Timken carbide insert bits will give you higher speeds and greater economy. And for extremely deep holes, constant-gauge holes, or small diameter blast holes, Timken carbide insert bits are again your best bet.

Your drillers will save time with Timken rock bits—multi-use or carbide insert—because they're interchangeable in the same thread series. Dozens of Timken rock bits fit the same drill steel. Change them as fast as the ground changes.

And you get these extra advantages with all Timken rock bits: 1) they're made from the Timken Company's own electric furnace fine alloy steel; 2) they have the special shoulder union developed by the Timken Company to protect threads from drilling impacts.

Find out which Timken rock bit is best for your needs. Call or write the Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

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best bit for every job



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multi-use rock bit



Timken threaded
carbide insert rock bit